The IRON AGE

January 23, 1958 A Chilton Publication The National Metalworking Weekly

Carpenter Steel's Frank Palmer

Plan Now To Avoid Excess Inventories P. 35

How to Cut Costs In a Falling Market – P. 40

Wanted: New Metals For High Temperatures – P. 75

Digest of the Week P. 2-3

This sort of "school room" keeps Wean Engineers at the top of their class. It's typical of...

WEAN CREATIVE ENGINEERING

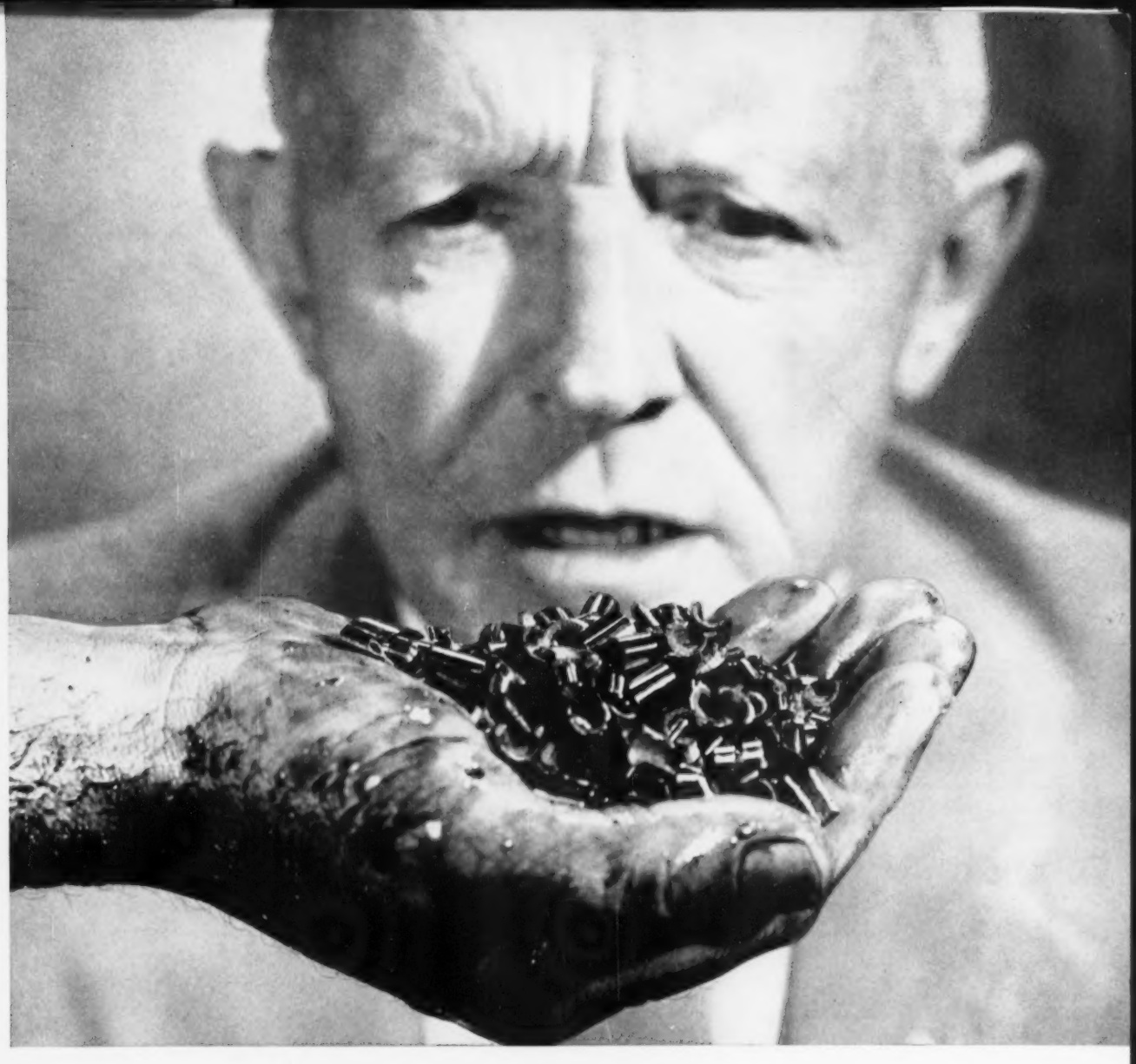
The "students" are Wean Engineers—

The instructor, D. W. Plumer—a General Electric Company Application Engineer. The occasion: G-E's Application Engineering Course being presented outside the G-E organization for the first time.

Wean feels honored to participate in this important industrial "first". It is in line with an established policy of research and development which gives added meaning to the phrase . . . (WEAN CREATIVE ENGINEERING)

THE WEAN ENGINEERING COMPANY, INC., WARREN, OHIO

611

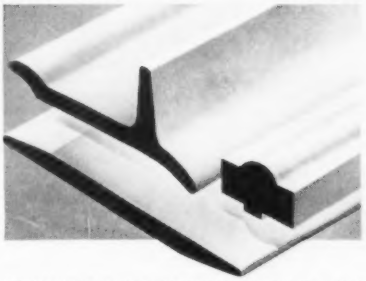


A handful of reasons for using special bar sections

Chips. Just chips. But how eloquently they state the case for special bar sections!

Why cut or grind away excess steel that you've already paid for? Let us roll the steel to your drawings and specifications. You'll keep scrap to a minimum, eliminate excess operations. And chances are you'll have a better, stronger product to boot.

Hot-rolled special sections rolled by Bethlehem are used in typewriters, pipe wrenches and freight cars; in electric motors, automobile differentials and open-grid grating; for sled runners, door hinges and garden tines; for track shoes, scraper blades and lawn-mower blades. The possibilities are virtually endless. Couldn't *you* use special sections to advantage? We'd be glad to discuss the matter with you. Please call or write our sales office nearest you.



BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

THE IRON AGE
Chestnut and 56th Sts.
Philadelphia 39, Pa.
SHerwood 8-2000

GEORGE T. HOOK, Publisher

EDITORIAL STAFF

TOM C. CAMPBELL, Editor-in-Chief
GEORGE F. SULLIVAN, Editor
Managing Editor — E. C. Beaudet
News-Markets Editor — J. B. Delaney
Asst. News Mkts. Ed. — R. D. Raddant
Technical Editor — J. J. Obrzut
Machinery Editor — E. J. Egan, Jr.
Metallurgical Editor — P. M. Unterweiser
Materials Editor — Wm. Czygan
Engineering Editor — R. H. Eshelman
Art Director — J. A. Degen
Associate Editors: F. J. Starin, P. J. Cathey, R. Schulin, F. T. P. Plimpton, Jr.
Assistant Editor: J. A. Moore. Regional Editors: K. W. Bennett, Chicago; T. M. Rohan, Cleveland; H. R. Neal, Detroit; G. G. Carr, New York; R. R. Kay, Los Angeles; G. J. McManus, Pittsburgh; G. H. Baker, R. M. Stroupe, N. R. Regeimbal, Washington. Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. M. Edmonds, St. Louis; J. Miller, San Francisco; R. Kazarian Buffalo; D. A. Coughlin, Seattle; F. Sanderson, Toronto; F. H. Harley, London, England; Chilton Editorial Board: Paul Wooton, Washington representative.

WASHINGTON EDITORIAL OFFICE
Washington 4 — National Press Bldg.

BUSINESS STAFF
Production Manager — Warren Owens
Director of Research — Oliver Johnson
Circulation Mgr. — W. M. Coffey
Promotion Manager — Richard Gibson
Asst. Research Dir. — Wm. Laimbeer

REGIONAL BUSINESS MANAGERS
Chicago 1 — T. H. Barry, W. R. Pankow, 360 N. Michigan Ave. — Randolph 6-2166
Cleveland 15 — Robert W. Watts, 930 B. F. Keith Bldg. — Superior 1-2860
Columbus 15, Ohio — Harry G. Mumm, LeVeque-Lincoln Tower — Capital 1-3764
Detroit 2 — W. J. Mulder, 103 Pallister Ave. — Trinity 1-3120
Los Angeles 28 — R. Raymond Kay, 2420 Cheremoya Ave. — Holly'd 3-1882
New York 17 — C. T. Post, I. E. Hand, 100 E. 42nd St. — Oxford 7-3400
Philadelphia 39 — B. L. Herman, J. A. Crites, W. E. Carr, Chestnut & 56th Sts. — Sherwood 8-2000
Pittsburgh 22 — T. M. Fallon, 1502 Park Bldg. — Atlantic 1-1830
San Francisco 3 — Don May, 1355 Market St. — UNderhill 1-9737
Tulsa — H. E. Mott, J. W. Sangston, 621 Petroleum Bldg. — Luther 4-1769
W. Hartford 7 — Paul Bachman, 62 LaSalle Rd. — Adams 2-0486
England — Harry Becker, 15 Gratton St., Altrincham, Cheshire

One of the Publications Owned and Published by Chilton Company, Chestnut & 56th Sts., Philadelphia 39, Pa.

OFFICERS AND DIRECTORS
Joseph S. Hildreth, Ch. of the Board
G. C. Buzby, President
Vice-Presidents: P. M. Fahrendorf, Harry V. Duffy, George T. Hook, Robert E. McKenna, Leonard V. Rowlands; Treasurer, William H. Vallar; Secretary, John Blair Moffet; Directors: Maurice E. Cox, Frank P. Tighe, Everit B. Terhune, Jr., Russell W. Case, Jr., John C. Hildreth, Jr.—Comptroller, Stanley Appleby.

Indexed in the Industrial Arts Index and the Engineering Index.

EPA NBP

Copyright 1958 by Chilton Company

THE IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the Act of March 3, 1879. Price to the metal-working industries only or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere Countries, $25; other Foreign Countries, $35 per year. Single Copies 50¢. Annual Review Issue $2.00. Cable: "Ironage," N. Y.

The IRON AGE

January 23, 1958—Vol. 181, No. 4

Digest of the Week in

*Starred items are digested at right.

EDITORIAL

If We Win, We May Lose. But if We Lose, We're Lost — 7

NEWS OF INDUSTRY

*Special Report: Plan Now to Avoid Excess Inventories — 35
Get Set for Tougher Bargaining — 38
*Copper Tariff Becomes an Issue — 39
*Pre-Planning Eases Cutbacks — 40
*Wages, Prices Are Key to Recovery — 41
*New SIC Codes an Aid to Sales — 42
*Defense Firms Look to 1959 — 44
The IRON AGE Salutes — 49
Men in Metalworking — 64

FEATURE ARTICLES

*What We Need in High-Temp Material — 75
*Buffing Setup Increases Output — 78
*How to Measure Slack Quenching — 80
*Production Control for Small Firms — 83
Descaling Line Cuts Stock Costs — 86
*Sintered Metals Approach Properties of Wrought Alloys — 88

NEWS ANALYSIS

Newsfront — 33
Report to Management — 51
*Automotive — 52
*Washington — 57
West Coast — 58
*Machine Tool — 60

MARKETS & PRICES

*The IRON AGE Summary — 105
*Purchasing — 106
Steel Products Markets — 108
Index to Prices — 109
Iron and Steel Scrap Markets — 110
Nonferrous Markets — 114
Clearing House — 124

REGULAR DEPARTMENTS

Fatigue Cracks — 11
Exhibits, Meetings — 13
Free Literature — 97
Technical Briefs — 100
New Equipment — 102

INDEX TO ADVERTISERS — 129

NEWS ARTICLES

COPPER

Tariffs Are the Issue—The latest price sag is forcing the issue of a higher copper tariff. A bipartisan

group of congressmen have presented a bill. Top copper management is planning what stand to take.
P. 39

U. S. ECONOMY

Controls Threatened—President's report on the national economy threatens controls if wages and prices get out of line. Recovery from recession is predicted late this year.
P. 41

DEFENSE DEPT. CHANGES

Brass Opposed—Military leaders will fight changes in Defense setup. Some change may be inevitable, but even Ike will have a tough time making them stick in the Pentagon.
P. 57

AUTO LABOR

Drops Profit - Sharing Bomb—Auto companies have reacted violently to Reuther's proposal that

Metalworking

INVENTORY TIPS: Carpenter Steel Co.'s President Frank R. Palmer discusses the tricky problem of keeping steel inventories in balance. His advice may lead you to the middle ground where stocks are neither too high for profits nor too low to meet production needs. P. 35

workers share in company profits. And so have factions within the union who want a short work-week. P. 52

INVENTOR'S KIT

Makes Working Models—A new sort of super Erector set permits inventors and designers to test plans before going into full-scale construction. The kit contains up to 4700 parts including gears, drives. P. 60

FEATURE ARTICLES

HIGH TEMP MATERIALS

What's Needed Today — We're short on high temperature materials and low cost techniques for building space-age planes and missiles. The importance of this problem is seen in a summation of our present position and the developments that are urgently needed. P. 75

BUFFING SETUP

Boosts Output, Saves Space—Requiring one-third less space than former straight-line machines, new polishing units buff a total of 30,000 stainless moldings each 16-hr day. There's no clamping necessary as moldings go through timed buffing cycle. P. 78

SLACK-QUENCHING

How to Measure Effects—In the heat treatment of steels, slack-quenching is usually a pitfall you try to avoid. But when the effects of slack quenching are carefully measured and controlled, it may turn out to have a few real assets. It may also contribute to important savings in critical materials. P. 80

PRODUCTION CONTROL

Model Benefits Small Firm—A small firm tailors big-plant ideas for its own use. It's the difference between profit and loss, a way to cut production tieups and delayed shipments to customers. P. 83

SINTERED METALS

Improved Properties—The result of recent effort is an important breakthrough — ferrous alloy powders that attain properties approaching those of wrought materials in a single, simple press-sinter operation. P. 88

MARKETS & PRICES

DEFENSE CONTRACTS

Look to 1959—Unsettled defense picture leaves contractors with excess capacity. Firm hopes for 1959 may bring aircraft and missile makers into the market for capital goods next year. P. 44

CUTTING COSTS

Pre-Planning Helps—In a falling market, it's mandatory to cut your operating costs. New methods avoid arbitrary across-the-board cuts with planned, selective economies. P. 40

NEW SIC CODES

Aid Market Research—The new 1957 Standard Industrial Classification Codes fill the gaps in the old 1945 SIC. Industries, products are grouped more uniformly than before. And a handy table makes conversion to new numbers easy. P. 42

STEEL BUYERS

Leap-Frogging—Shifting and reshifting orders puts tremendous pressure on mills. Delivery demands are considered excessive by some. Mill competition becomes more intensive. P. 105

PUMP PRICES

Few Increases Likely — Most pump manufacturers are not thinking in terms of price hikes these days. They're concentrating instead on developing and selling new products. P. 106

NEXT WEEK

EXECUTIVE RATING

It Pays Off—The smooth functioning of an executive rating program can be as important to a company as technological advance. Next week's special survey report examines the methods. It includes a report on 400 companies.

TUBING PERFORMANCE and WORKABILITY BEGIN with the MELTING OF STEEL

Tensile strength, corrosion resistance, resistance to "creep" at elevated temperatures and reaction to heat treatment are only a few of the mechanical and physical characteristics of a steel which are controlled by chemical composition. In addition to analysis, "melting practice" controls such factors as the cleanliness of the steel, its grain size and its hot workability.

Chuck Connor, melter and *Bob Schriner, first helper* are shown making "additions" during the melting of a heat of alloy steel in one of B&W's electric melting furnaces. They know that what they add, and when and how they add it during the melting cycle helps make B&W Seamless Tubing easier for you to fabricate and gives the tubing optimum service life.

Years of experience and attention to detail and the coordinated efforts of the entire team of B&W technicians, furnace operators, metallurgists, engineers and chemists help make the name "B&W" the hallmark of tubing quality. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

TA 6050-G5

Seamless and welded tubular products, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels.

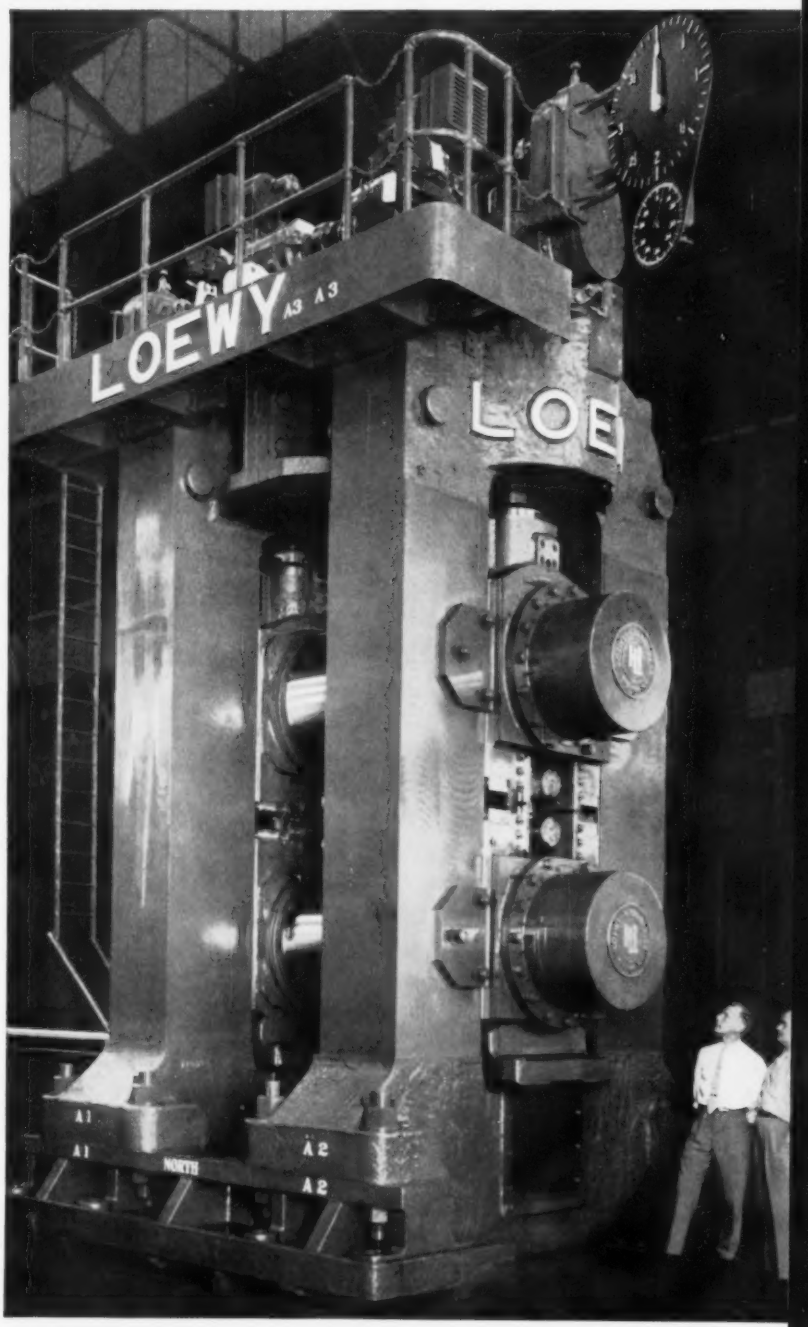
Loewy-Hydropress delivers powerful reversing mill within just 10 months of order date

Within only 10 months of the time it was given the go-ahead signal, Loewy-Hydropress has designed, built and delivered a rugged and powerful reversing mill for rolling slab ingots of particularly hard alloys.

The smooth operation and high efficiency of this unusual metal-forming installation can be attributed to Loewy's exceptional design ingenuity and wide engineering experience. But how was it possible to build it in record time, to supply it *ahead* of the promised delivery date? The answer is simple. As a division of Baldwin-Lima-Hamilton, Loewy-Hydropress has at its disposal the vast, yet smoothly integrated, resources of one of the nation's most diversified industrial organizations. B-L-H's unsurpassed facilities assure you of products that meet the most exacting quality requirements. And close coordination among all B-L-H divisions is the chief reason why Loewy-Hydropress can deliver your rolling mills faster.

Outstanding Loewy rolling mill installations for steel and nonferrous metals are operating in this country and abroad. Loewy designs, builds and installs rolling mills for hot and cold strip, sheet, foil, plate and wire rod; blooming mills, slabbing mills, rail and structural mills, billet mills, skelp mills, merchant mills, laboratory mills, specialty mills, and auxiliary equipment.

For detailed information, write us today, Dept. A-1.



Shown here on the erection floor is a 4-high rolling mill for newly developed hard alloys which was designed and built by Loewy-Hydropress.

Loewy-Hydropress Division
BALDWIN · LIMA · HAMILTON
111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering

BALDWIN BLH LIMA-HAMILTON

How to avoid the Purchasing-Production Squeeze

Control of inventory costs is going to be more important than ever during the coming months.

Production, as always, will want to be sure there's enough of the right materials to keep production rolling.

Management will, of course, want to keep investment in inventories under careful control.

This two-sided responsibility makes more difficult the job of buying in the most economical quantities to meet projected requirements.

There's a good way out when it comes to steel: Ryerson immediate service.

With Ryerson carrying your steel inventory, you eliminate the risk of over-buying, minimize the cost of possession, yet assure your machines all the steel the schedule calls for. You can draw on Ryerson stocks for the kind of steel you want, in the quantities you want, and get it exactly when you want it.

You gain complete flexibility of steel supply without long-term commitments. Should production call for a change in the kind of steel needed, you won't be caught with large stocks you cannot use. Ryerson carries the nation's largest stocks . . . is known for fast, dependable delivery . . . can help you combine orders for still lower costs.

A phone call to Ryerson is the first step in tightening steel inventory control and reducing your over-all steel costs.

RYERSON STEEL

Member of the Steel Family

Principal Products: Carbon, alloy and stainless steel—bars, structurals, plates, sheets, tubing—aluminum industrial plastics, metalworking machinery, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE CINCINNATI • CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

If We Win, We May Lose But if We Lose, We're Lost!

The President's budget placed the emphasis where it should be—on proper defense. It also pleaded for cutbacks and common sense in other areas in order to help support the defense program.

Many congressmen now want to crack the spending barrier on non-military items. This is an election year and the politicians are running scared. There is nothing new in that.

But there is something new and terrible in the realization that Russia is playing with a two-headed coin. She and her cohorts would like to win this global struggle without a war. It would be easier, gain her more friends and—she hopes—eventually break our backs.

No country in history has ever been in as tough a spot as the United States now finds itself. Everyone wants solutions. But they don't always come. When they do, they don't come easy.

Take the current budget: it may not be big enough to take care of the ultimate things that have to be done. Or Congress may hang so many increases on it that it will be much higher: All this when incoming revenues are declining.

Some businessmen will be crying for relief from the current recession. Unions will be after more pay to make up for layoffs and shorter time. World conditions will require that we do not let down in building up our defenses.

Old age pension advocates will be hammering away for more money. Veterans groups will be fighting any attempts to trim the ever-growing veterans programs. Under the guise of defense, Federal handouts will be demanded for education and schools.

It's easy to say "Someday all this must stop." The trouble is it doesn't. This basic problem calls for far more than politics, business as usual, wage price spirals and creeping inflation.

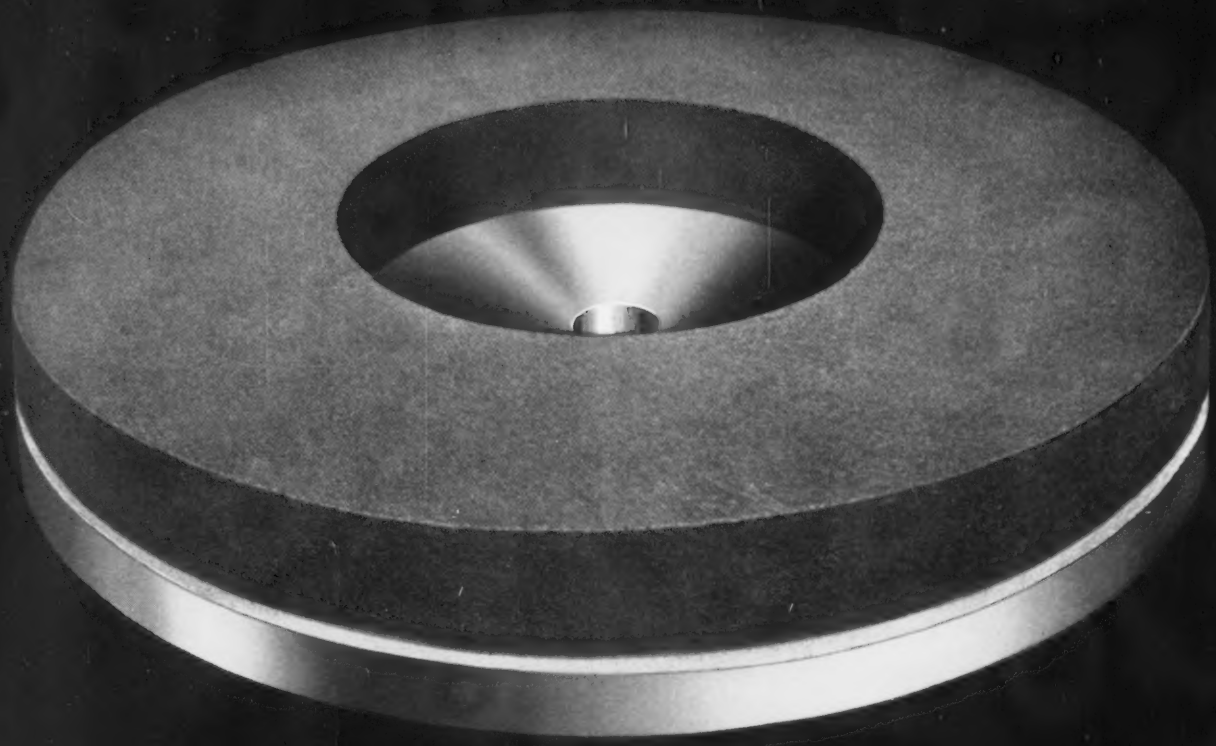
We barely got our house in order during the recent high prosperity years. Now we are laying the groundwork for another inflationary binge. Where it will take us no one knows. But this we do know: If we wreck our country, the Reds will win. And if they start a war, everyone will lose.

Their coin says, "heads I win, tails you lose." That's what we must live with every day of our lives—until we work our way out of it.

And that will take some working!

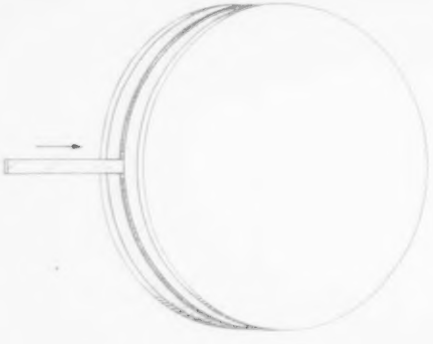
Tom Campbell

Editor-in-Chief



Change to Gardner discs increases metal removal by 40%

...gives longer disc life and lowers grinding costs



Workpiece:..... Bar stock—¼" to 1¼", 3' to 19' long.

Operation:..... Grind parallel sides.

Stock Removal:.. Former discs—average of 179 lbs. of stock removed per set of discs.

GARDNER discs—average of 250 lbs. of stock removed per set of discs.

The tangible benefits of more efficient disc grinding can also be applied to your particular production. Call your Gardner Abrasives Man for demonstration.

GARDNER

abrasive discs

BELOIT, WISCONSIN

LETTERS FROM READERS

Heads Up

Sir—Your editorial of Dec. 12 (Keep Your Head Screwed On: You Cannot Afford to Lose It) is one of the best that I have read, and the title couldn't be better.

Good fortune for 1958.—J. A. Raterman, Pres., The Monarch Machine Tool Co., Sidney, O.

Tough Year

Sir—Your editorial (Every Year Is Tough; Don't Let This One Throw You) in your 103rd Annual Issue is a masterpiece. Congratulations!—G. G. Beard, Pres., United Engineering and Foundry Co., Pittsburgh.

Prosperous Recession?

Sir—Kindly send me two copies of the special report entitled, "Are We Heading Into a Prosperous Recession?" This report appeared in the Jan. 2 Annual Issue.

I wish to compliment you on an excellent piece of work.—L. H. Whitehead, Cosgrove, Whitehead & Gammack, New York.

Meteorites

Sir—I have just read the Dec. 5 article, "Meteorites: Metallurgy From Outer Space," by P. M. Unterweiser, and find it most interesting.

We should like to reprint this article in our house publication Power Notes, and would be grateful for your permission. Of course, full credit would be given to the author and to your publication. Our publication has a mailing list of approximately 17,000, composed principally of engineers.—W. P. Thomas, Chairman, Diamond Power Specialty Corp., Lancaster, O.

▪ Permission granted.—Ed.

Sir—The Survey Report to Management No. 9 entitled, "How to Plan for Lower Costs," in the Dec. 12 issue gives excellent coverage to an important and particularly timely subject. If an additional copy is still available, I am certain I could use it to advantage.—O. E. Cullen, Chief Metallurgist, Surface Combustion Corp., Toledo, O.

Sir—I was very much impressed by the article by Charles P. Hawkins in the Dec. 12 issue. The direct approach to cost cutting techniques was interesting, particularly in the area of costing and organization.

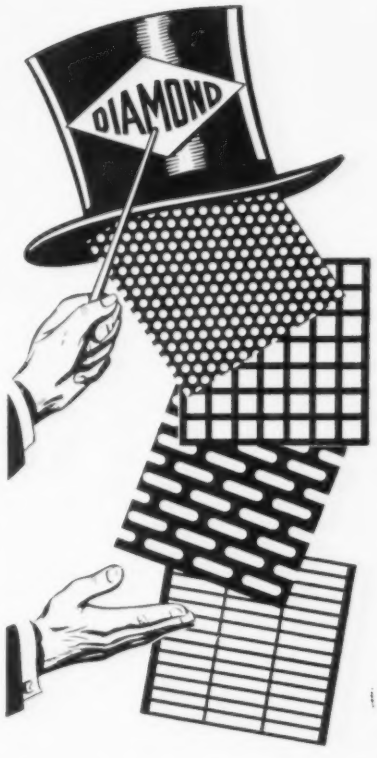
May I have a copy for my personal files?—H. C. Barney, Process Engr., Foundry Div., The Cincinnati Milling Machine Co., Cincinnati.

Sir—May I commend you on the excellence of the article entitled, "How to Plan for Lower Costs," in your Dec. 12 issue.

We would appreciate securing six reprints for distribution to key people in our organization.—P. G. Smouse, Purchasing Agent, Shore-Calnevar, Inc., Los Angeles.

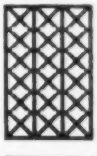
▪ Copies are on the way.—Ed.

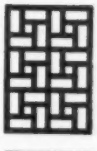
"And what was your occupation from 1930 to 1940 in Ossining, New York?"



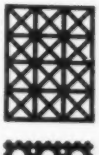
Top-Hat Quality IN Perforated Metal

The popular Diamond Perforated-metal patterns shown above are only a few of the many illustrated and described in our 32-page Catalog No. 39. All of these standard patterns are available in a wide range of unit-opening sizes and we are always equally pleased to quote on original designs of any type or size.

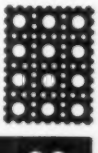




Catalog 39 also illustrates and describes our high-quality lines of *Ornamental Cane*, Perforated-Metal Sheets for Accoustical installations and Heavy-Duty Architectural Grilles. Write, today, for a free copy.

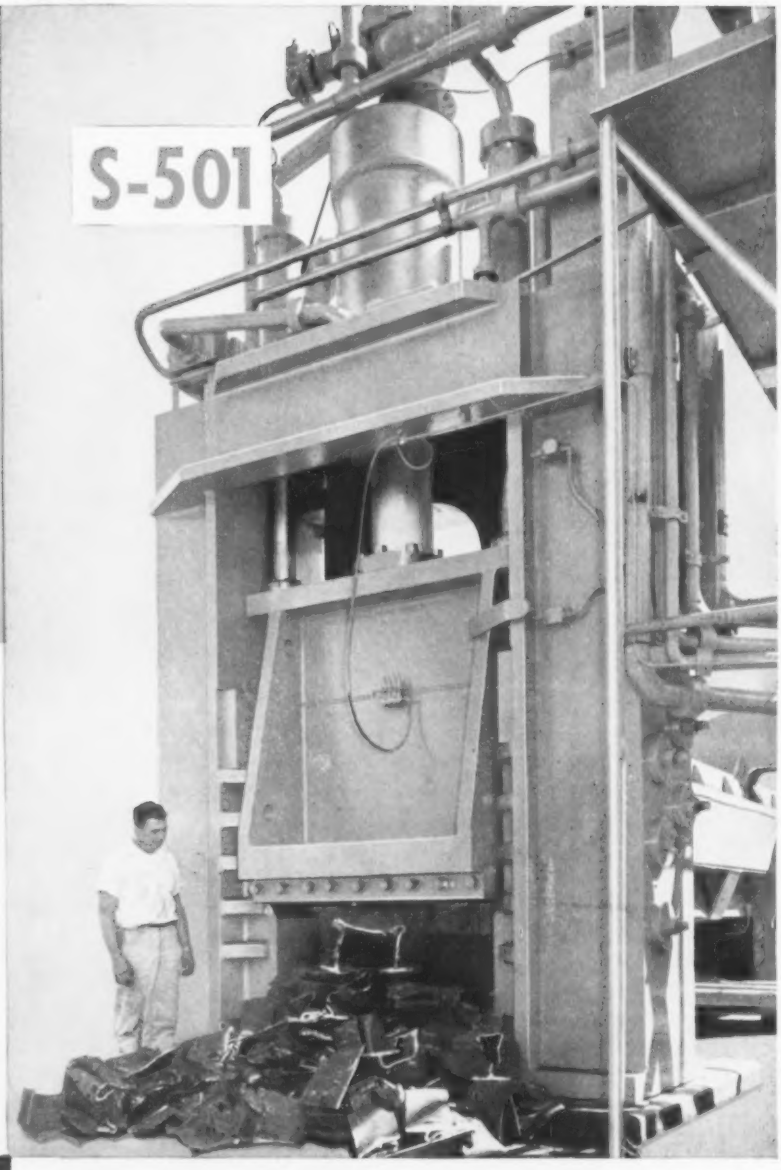


Correspondence is especially invited regarding ANY requirement for perforated-metal panels or parts. We are equipped to fabricate special sections to any desired extent and welcome opportunities to make money-saving suggestions.



DIAMOND MFG. CO.
WYOMING WILKES-BARRE AREA PA.
West Coast Plant,
DIAMOND PERFORATED METALS CO.
17915 So. Figueroa St., Gardena, California
Los Angeles Area

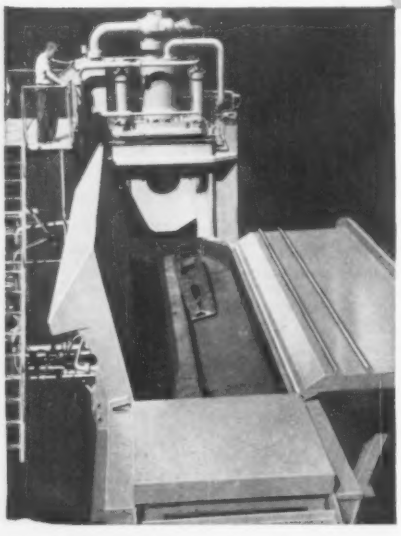
CUTS 200 TONS PLATE SCRAP IN EIGHT HOURS



production is continuous

labor costs 70% lower

The Harris Shear is revolutionary in design. It is the first new development in the scrap industry since the introduction of the Baling Press. Railroad scrap, pipe, farm, industrial, automobile and miscellaneous junk shop scrap work through on a 12 second cycle. A 3 man crew and a crane handle the job in all kinds of weather.



The charging box is 264" x 80" x 30". It has a flat type loading hopper. The cover and charging ram operate like a baler. This means more material under each stroke of the knife.

The Harris Shear brings new profits to Scrap Yards

HARRIS FOUNDRY & MACHINE CO.

Hydraulic Engineers Since 1889

CORDELE, GEORGIA

▶ *Talk with a Man from Harris*

FATIGUE CRACKS

Missile Business

In the Jan. 9 issue, we carried a Special Report on the Missile Boom, what it means to metalworking, etc. Included in the information was a list of U. S. Army Ordnance districts, which can help interested companies in getting into the missile field.

Inadvertently, the Pittsburgh Ordnance District, 200 Fourth Ave., Pittsburgh 22, Pa., was left off the list.

Capt. Needham, there, tells us his group is fairly active in the field, would like us to do what we can to make this group known.

So if you are located in the Pittsburgh area, and would like to see if you can help out in the missile effort, call Capt. Needham.

Jokelifters, Inc.

We're rather tired of the side remarks passed about the lack of humor in this column. So, not being very funny ourselves (we're telling you), we've lifted every funny joke we could lay our ears on. After you finish reading below you'll probably realize we can't tell a joke even if we hear one. But, here goes:

Las Vegas Humor—A tourist, funds sadly depleted after a two-week stay at Las Vegas, was driving homeward on the highway. Suddenly he heard an ethereal voice whisper in his ear. "Go back to Las Vegas", it said.

The tourist turned his car around, was soon in Las Vegas when the voice said, "Go to the roulette table at the Desert Inn."

Thoroughly shaken, the tourist approached the table when again the voice whispered mysteriously, "Put all your money on 22 red."

Now feverishly excited, the tourist put up his remaining money, watched the pellet go round and round—and finally land on 17 black.

Then the voice whispered, "How about that?"

Health Humor—Seems this fellow's wife was a little on the heavy side. The family doctor suggested a diet of coconuts and bananas.

A few weeks later the husband met the doctor on the street. "Has the diet done your wife any good?" the doc asked.

"Well she hasn't lost any weight," Hubby answered, "But she sure can climb a tree."

What You Can Do—If you don't want to put up with this anymore send your own jokes in.

New Puzzler

J. Roger Harris, Hydro Metal Spinning Corp., Los Angeles, sends this one, and many thanks.

We have three men, A, B and C, who go into a darkened closet and there are five hats, three black and two white. "A" selects a hat and leaves the closet and stands facing a wall. "B" then selects a hat and leaves the darkened closet and stands directly behind "A." Then "C" repeats this by selecting one and stands behind "B."

When asked what color hat he has on, "C" replies, "I don't know." Then "B" is asked the same question and says, "I don't know." What color hat does "A" have on?

"Orders from the boss. He wants to see you right now!"

Atlas

PICKLE TANKS COST LESS LAST LONGER

. . . compared to expensive alloys!

Today in the light of ever increasing costs, Atlas offers you economical pickle tank construction that will give you longer trouble free life. This is accomplished by the use of a mild steel or concrete shell protected by corrosion-proof linings and acid-brick sheathing joined with corrosion-proof cements. These Atlas tanks are impervious to today's stronger pickling solutions and higher operating temperatures. A wide choice of cements is available, each best suited for a specific condition.

Atlas construction is far less costly to install than expensive alloys. In addition Atlas tanks are corrosion-proof inside and out and are engineered to withstand hard physical abuse from shifting loads.

For a lower initial cost, longer life expectancy and complete protection against corrosion, see Atlas first.

Write for Atlas Bulletins 5-2 and C-1.

ATLAS MINERAL PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA

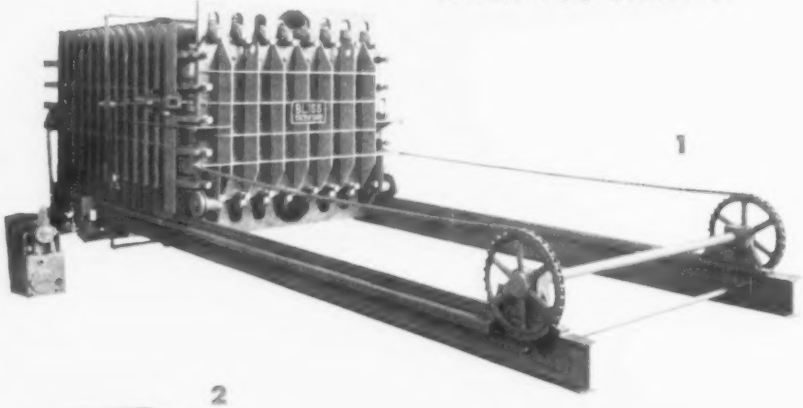
Here are just four examples of the wide range of contract weldments now being fabricated by Bliss. Large and small, ferrous and non ferrous, calling for specialized techniques, jobs like these are an every-day thing to the Bliss personnel in Contract Manufacturing.

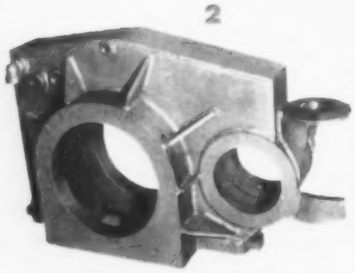
Their experience, combined with heavy machining, welding, metallurgical treatment and inspection facilities, make Bliss a reliable source of welded fabrications. If weldments are your problem, drop us a line... we'll be glad to discuss it with you.

WELDMENTS BY BLISS

...WHAT YOU WANT WHEN YOU WANT IT

1 FILTER PRESS, used in processing of aluminum ore, requires extensive amount of welding. **2 GEAR CASE FOR SUBWAY CAR DRIVE UNITS** is made of welded, pre-machined steel plate; it weighs less than original casting and lowered machining costs. **3 LIGHTWEIGHT ALUMINUM CHIP BUGGY,** welded by Bliss to customer design, reduces handling fatigue considerably. **4 WELDED ALUMINUM STAIRWAY** for factory is rugged, light, attractive, requires no maintenance.





BLISS SINCE 1857 ®

100 years of making metal work for mankind

E. W. BLISS COMPANY

With major weldment facilities at two plants: Salem and Canton, Ohio

EXHIBITS, MEETINGS

Plant Management and Engineering Show—Jan. 27-30, 1958, International Amphitheatre, Chicago.

Packaging Machinery and Materials Show—March 25-28, Convention Hall, Atlantic City, N. J. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

JANUARY

Association of Steel Distributors, Inc.—Convention, Jan. 26-Feb. 2, Algiers Hotel, Miami Beach, Fla. Society headquarters, 29 Broadway, New York 6.

Industrial Heating Equipment Assn.—Annual meeting, Jan. 27-28, Penn-Sheraton Hotel, Pittsburgh. Society headquarters, 1145 19th St., N. W., Washington 6, D. C.

Society of Plastics Engineers, Inc.—Annual technical conference, Jan. 28-31, Sheraton-Cadillac Hotel, Detroit. Society headquarters, 34 E. Putnam Ave., Greenwich, Conn.

FEBRUARY

The Society of the Plastics Industry, Inc.—Reinforced Plastics Div. —Annual technical and management conference and exhibit, Feb. 4-6, Edgewater Beach Hotel, Chicago. Society headquarters, 250 Park Ave., New York 17.

Malleable Founders Society—Technical and operating conference, Feb. 6-7, Wade Park Manor, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

American Society for Quality Control—Annual conference on management by exception, Feb. 7-8, Carter Hotel, Cleveland. Information: B. F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland.

Non-Ferrous Founders' Society—West Coast management & operating conference, Feb. 7-8, Ambassador Hotel, Los Angeles. Society

(Continued on P. 16)

only Speed-D-Burr gives you these...
..."dollar saving"
EXTRA FEATURES at No Extra Cost!
HINGED
Barrel Door
with quick-acting cam locks
Reduces opening and closing time by 90%. Prevents improper door replacement. This one feature alone can save $3.00 to $25.00 every day used.
You are paying for a complete machine — Be sure you get one! Check features and cost of unit delivered in your plant!
FUTURAMA SERIES DELUXE MODEL
VARI-SPEED MOTOR
Provides a 5 to 1 ratio, infinite speed range from 4 RPM to 20 RPM. Permits wide versatility in finishing cycle.
GREATER BARREL CAPACITY IN ALL SIZES
Compared with the nearest competitive equipment the SPEED-D-BURR barrels offer 10 to 18% GREATER CAPACITY.
PRESET START AND STOP TIMER
Eliminates need for close time cycle supervision. Works automatically when preset. Just set time cycle — forget it! Even works while you sleep!
POSITIVE STATIC BRAKE
Gives smoother stopping with less wear and tear on equipment — thus practically eliminating maintenance costs.
STANDARD REPLACEMENT PARTS
Service and Parts available in all major areas
Service is our most important product ... it does NOT cost — IT PAYS!
SPEED-D-BURR
PRECISION BARREL FINISHING
Write for Complete Short Form Catalog to Dept. IA-1
THE WORLD'S MOST COMPLETE LINE OF BARREL FINISHING EQUIPMENT AND SUPPLIES

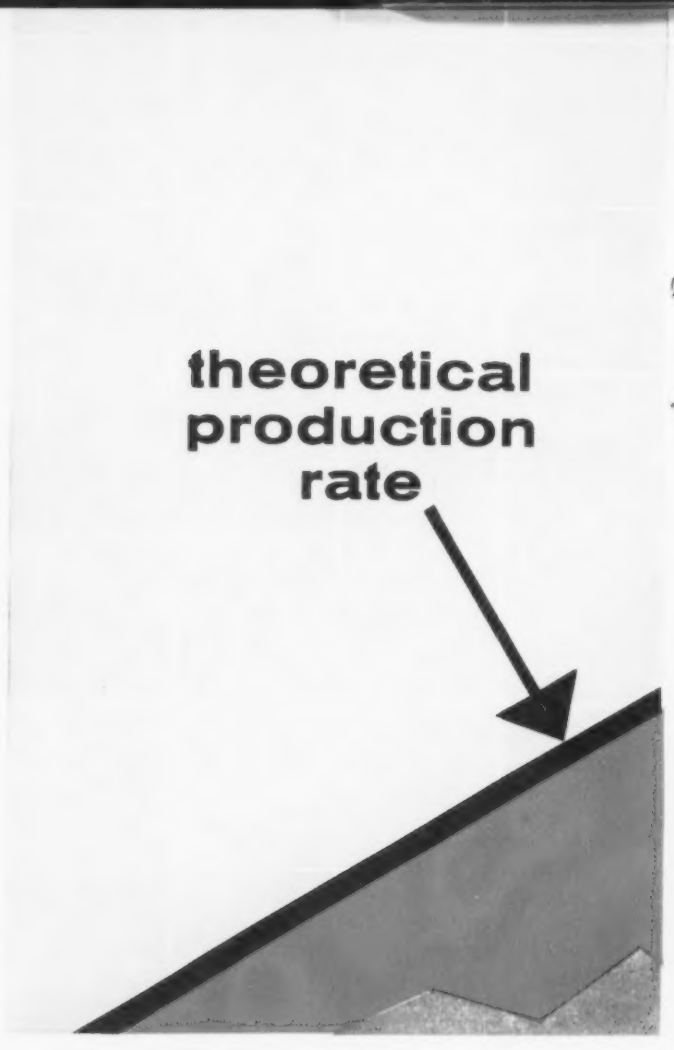
SPEED-D-BURR CORPORATION

3613 San Fernando Rd. • Glendale 4, Calif. • CHapman 5-2468

with

Productive Maintenance

in action

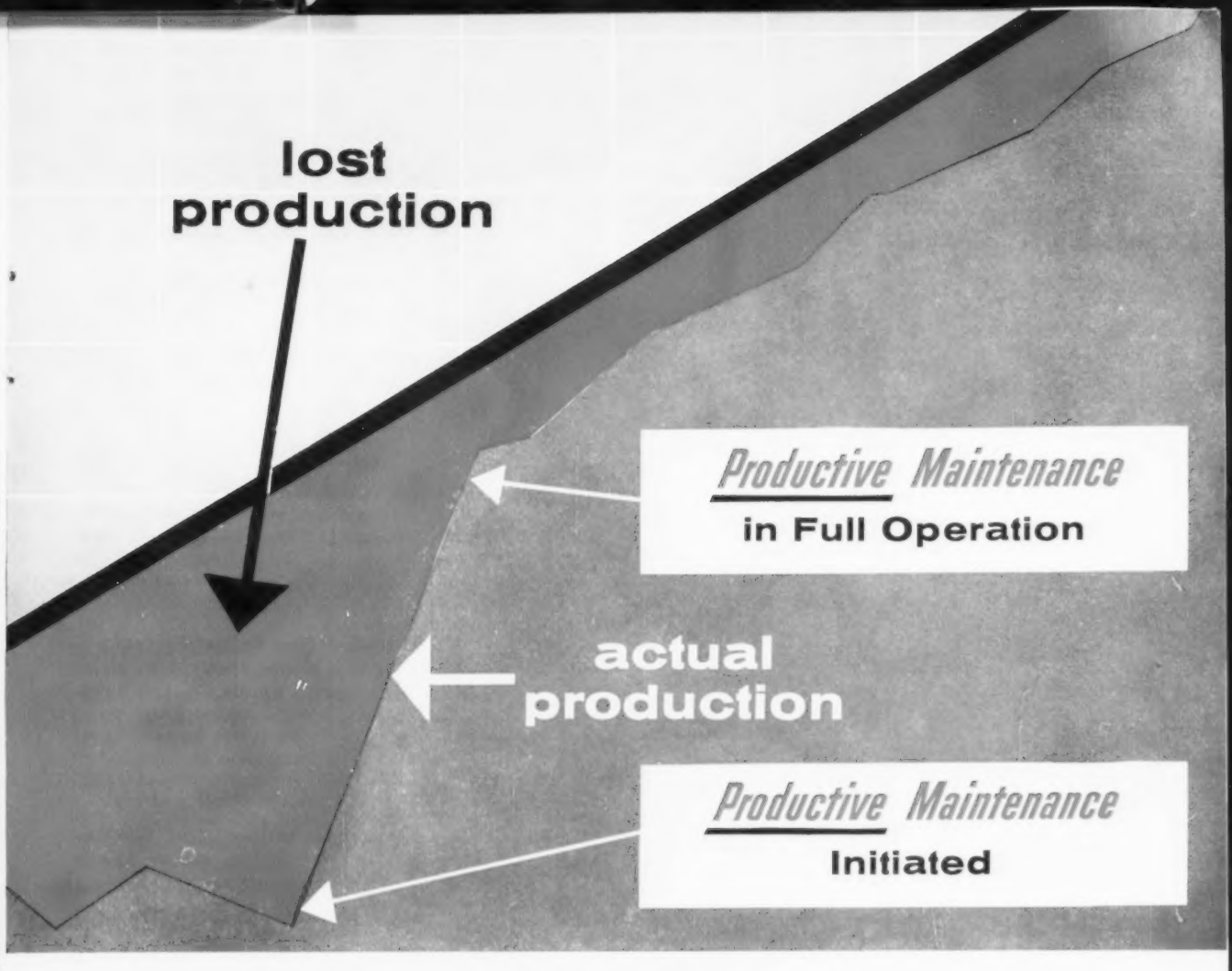


Your Maintenance Can

Unscheduled downtime means loss of production and vital profit dollars—Productive Maintenance helps you plan for profit

MAINTENANCE FUNCTIONS in manufacturing were once considered to be necessary evils burdening the production process. Little attention was given to the proper programming of vital equipment maintenance. Without a planned approach, non-essential production equipment often received too much attention, while important production machinery received too little. Result: high maintenance costs, frequent unscheduled downtime, loss of production.

The competitive requirements of modern manufacturing have brought the maintenance operation into sharp focus. Maintenance is being studied now as a major factor leading to more profitable production. It is being scheduled and implemented in all areas of successful business. One new concept of maintenance programming has received much comment and acceptance from industry. This program, called *Productive* Maintenance, is based on the fact that the maintenance



Become Profitable

function *can* make a definite contribution to a company's profit and production picture. Here's how:

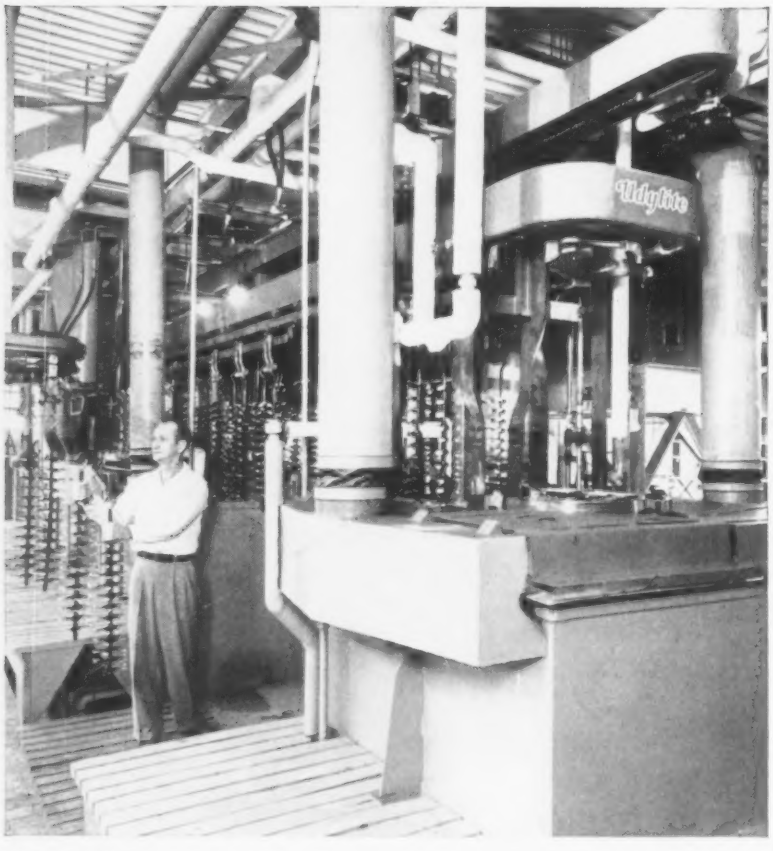
ILLUSTRATED ABOVE is a production-line maintenance chart of a typical company—before and after a *Productive* Maintenance program was adopted. Without a planned approach to maintenance, frequent unscheduled downtime interrupted manufacturing—created a large area of lost production—and prevented the benefits of full production capacity. As mechanization increases, this production loss will be magnified because of the interdependence of manufacturing components.

With *Productive* Maintenance in action, greater utilization of manufacturing equipment was realized. Unscheduled downtimes were reduced and their effect minimized by means of a thorough parts stocking program for all critical production equipment. Maintenance of equipment essential to production was scheduled at convenient times. Production schedules were met, more efficient utilization of trained manpower and machinery was achieved, repair parts inventories were stabilized, and unit production costs were reduced. Altogether, these benefits resulted in actual dollar savings—*maintenance became profitable.*

REGARDLESS of the size of your maintenance problems, it will pay you to check into the advantages of *Productive* Maintenance. For additional information on General Electric's answer to such a program of planned maintenance, contact your nearest G-E Apparatus Sales Office, or G-E Service Shop. They will be glad to provide you with *Productive* Maintenance assistance. Also write for bulletins GEA-6087, 5-steps to Productive Maintenance, and GED-3278, Productive Maintenance In Action, to Section 801-21, General Electric Company, Schenectady 5, N. Y.

Productive Maintenance—
as vital as production itself!

GENERAL ELECTRIC



Udylite Machine and Process combine to set new Scripto standards

The Udylite Cyclemaster provides the accuracy and steady flow of production. Udylite Bright Nickel furnishes the sparkling finish. Together they solve for Scripto, of Atlanta, Georgia, the knotty problem of better finish of the Scripto pens, pencils and cigarette lighters.

Scripto's first bright nickel was the Udylite #31 process. It was superseded by the Udylite #514 process to gain the faster brightening which is so important in nickel plating to a high luster with a thin coat.

The adoption of Udylite Bright Nickel Process #724 was the next step as it offered still faster brightening and even more important all the time saving advantages of all liquid brighteners.

Step by step Scripto has lowered costs and improved quality with Udylite Processes and Precision Automatic Plating. Here is just one of many examples of the right application of process and equipment. Out of the line of Udylite products can come the answer to your problem as well.

Contact your local Udylite Sales Representative . . . let him show you how the *right* combination of Udylite processes and machines can improve your quality and production.

THE Udylite CORPORATION DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

EXHIBITS, MEETINGS

(Continued from P. 13)

headquarters, 1604 Chicago Ave., Evanston, Ill.

Institute of Surplus Dealers—Annual trade show and convention, Feb. 14-17, New York Trade Show Bldg., New York. Society headquarters, 673 Broadway, New York 12.

American Institute of Mining, Metallurgical & Petroleum Engineers—Annual meeting, Feb. 16-20, Hotels Statler and Sheraton-McAlpin, New York. Society headquarters, 29 W. 39th St., New York.

Assn. of Iron & Steel Engineers—Western meeting, Feb. 24-26, Hotel Statler, Los Angeles. Society headquarters, 1010 Empire Bldg., Pittsburgh.

MARCH

American Machine Tool Distributors' Assn.—Spring meeting, March 10-11, The Roosevelt, New Orleans, La. Society headquarters, 1900 Arch St., Philadelphia 3.

National Assn. of Waste Material Dealers, Inc.—Annual convention, Mar. 15-18, Waldorf-Astoria, New York City. Society headquarters, 271 Madison Ave., New York.

Steel Founders' Society of America—Annual meeting, Mar. 17-18, Drake Hotel, Chicago. Society headquarters, 606 Terminal Tower, Cleveland 13.

National Assn. of Corrosion Engineers—Annual conference and exhibition, Mar. 17-21, Civic Auditorium, San Francisco. Society headquarters, 1061 M&M Bldg., Houston.

International Acetylene Assn.—Annual spring convention, Mar. 19-21, The Bellevue-Stratford Hotel, Philadelphia. Society headquarters, 205 E. 42nd St., New York.

Learn More About BERYLLIUM COPPER by Reviewing This Latest Literature . . .

Aircraft Engine Part

✔ CHECK THE CORRESPONDING NUMBER ON THE REPLY CARD

TECHNICAL BULLETINS

27 **Tube Shields** of beryllium copper cool and protect tubes, lengthen life, improve reliability.
28 **Spark-resistant** quality of beryllium is important in many different applications.
29 **"BERYLCO"** plunger tips last 10 times longer on aluminum cold chamber die casting machines.
31 **Outdoor Lighting Equipment** is made service-safe by "BERYLCO" 10 strip.
34 **Cannon Plug** "pressures" connectors with a beryllium copper sleeve spring.
35 **Beryllium Copper** contacts increase printed circuit life 200%.
36 **Lebanon Steel Foundry** uses beryllium copper core box inserts to boost production; cost of each core was cut 70%.
38 **Fuse clips** of beryllium copper at Littelfuse, Inc. reduce contact resistance 60%, boost grip-strength 1000%.
39 **Automatic Lock Sliders** made by Serval have 3 instead of the usual 4 parts thanks to beryllium copper.

CATALOGS AND FOLDERS

222 **Wrought Alloys Catalog** — Physical and mechanical properties of the four basic alloys in all wrought forms. Includes data on processing techniques.
223 **Casting Alloys Catalog** — Advantages and properties of beryllium copper casting alloys; compositions, pouring ranges, casting methods and processing techniques.
224 **Beryllium Copper Dies** — Specific advantages reported from recent field developments where beryllium copper was used in plastic molds and dies, forging dies, steel forming and draw dies, titanium forming and draw dies, and metal bonding dies.
225 **Heat Treating** — Under the subject head of "Wrought Alloys", includes discussions on Advantages, Heat treat hardening, Special heat treating, Fixtures, Furnaces, Salt baths, Annealing, Cleaning and brightening. Similar topics are reviewed for "Casting Alloys".
226 **"BERYLCO" 10 Strip** — Four page folder describes this high conductivity beryllium copper alloy that has moderate strength, excellent thermal conductivity, and good corrosion resistance. This alloy used successfully in applications at temperatures up to 800° F. Charts, tables, graphs give complete physical and electrical properties.
227 **Price List** — Wrought alloys price list including quantity schedule, extras, weights, etc.

USE THIS CONVENIENT POSTAGE-PAID REPLY CARD

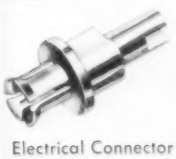
Fuel Injector

Double Torsion Spring

Spline Shaft

Precision Casting

Electric Switch Part



Electrical Connector

BERYLCO®

ALL LITERATURE IS FREE!

TECHNICAL BULLETINS

27	31	36
28	34	38
29	35	39

CATALOGS

222	225
223	226
224	227

SPECIAL

☐ Please add my name to your mailing list to receive all future literature on beryllium copper.

☐ Have an informed "BERYLCO" salesman call as soon as possible.

Name _____ **Title** _____

Firm _____

Address _____

City _____ **Zone** _____ **State** _____

"BERYLCO" BERYLLIUM COPPER ALLOYS

HAVE RESISTANCE TO:

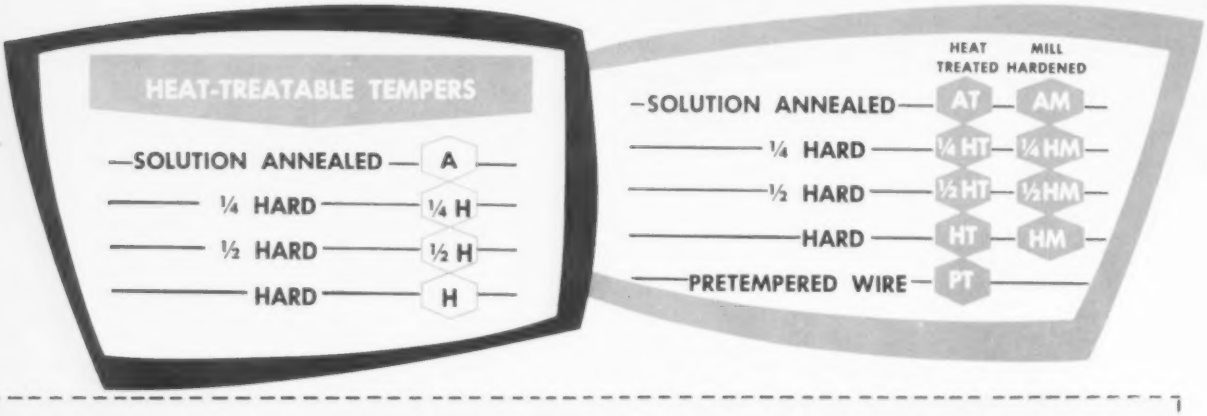
WROUGHT ALLOYS

• WEAR • CORROSION • MAGNETISM
• FATIGUE • SPARKING

CASTING ALLOYS

Manufactured by THE BERYLLIUM CORPORATION, Reading, Pa.

DESIGNATION	AVAILABLE FORMS	CHARACTERISTICS	DESIGNATION
"BERYLCO" 25	Rod, Bar, Strip, Wire	Highest strength copper base alloy (190,000 psi-tensile), good conductivity (22% IACS), excellent spring properties.	
"BERYLCO" 165	Strip Only	Slightly lower strength than "BERYLCO" 25, good conductivity, available in mill hardened tempers.	
"BERYLCO" 10	Strip, Rod, Bar	High conductivity (45% IACS), good strength (110,000 psi-tensile), excellent electrical properties.	
"BERYLCO" 50	Rod, Bar	Highest conductivity (50% IACS), good strength (110,000 psi-tensile), premium resistance welding electrode material (RWMA Class III)	
BERYLDUR	Strip Only	Lowest cost beryllium copper alloy, good strength (125,000 psi), good conductivity (22% IACS).	
	Casting Ingots, Finished Castings	**Cast version of "BERYLCO" 25, high strength and hardness, good conductivity, excellent castability.**	**"BERYLCO" 20C**
	Casting Ingots, Finished Castings	**Pressure-casting alloy for applications requiring highest hardness (Rc-45) plus excellent reproduction of detail.**	**"BERYLCO" 275C**
	Casting Ingots, Finished Castings	**Cast version of "BERYLCO" 10, high conductivity, good strength, good high temperature properties.**	**"BERYLCO" 10C**
	Casting Ingots, Finished Castings	**Cast version of "BERYLCO" 50, high conductivity, good strength, premium RWMA Class III alloy.**	**"BERYLCO" 50C**


HEAT-TREATABLE TEMPERS
—SOLUTION ANNEALED— A
¼ HARD — ¼ H
½ HARD — ½ H
HARD — H
HEAT TREATED
MILL HARDENED
—SOLUTION ANNEALED— AT — AM
¼ HARD — ¼ HT — ¼ HM
½ HARD — ½ HT — ½ HM
HARD — HT — HM
PRETEMPERED WIRE — PT

FIRST CLASS
Permit No. 757,
Reading, Pa.

BUSINESS REPLY CARD

No Postage Necessary if Mailed in the United States

4c POSTAGE WILL BE PAID BY

THE BERYLLIUM CORPORATION
P.O. BOX 1462
READING, PENNA.

Attn: W. S. Pollard

FOOT SWITCHES that can take it!

• **BUILT FOR THE TOUGHEST SERVICE** inside and out—from the maintenance free, snap action, double break, silver alloy contacts to the rugged, die cast aluminum housing—the redesigned Allen-Bradley Bulletin 805 foot switch is a challenge to tough jobs! The on-center treadle operation eliminates the need for bolting down the switch—the extended base keeps it from tipping.

• **VERSATILE OPERATION**—The contact trip point is easily adjustable. When equipped with two contact blocks, this foot switch can be set for simultaneous or two-stage operation. The Bulletin 805 foot switch can also be furnished with a latch to provide maintained contact operation. In addition, this latch, when desired, can be made inoperative, and may be quickly changed from one to the other side of the foot switch.

The Bulletin 805 housings are available for NEMA Type 4 watertight and oiltight applications, or NEMA Type 7 explosion-proof service.

Try the Allen-Bradley Bulletin 805 foot switch—you'll find it "tops" in its field. Send for full information.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

Bulletin 805 Style A switch with latch.

Bulletin 805 Style A switch with latch and top guard to prevent accidental operation.

Bulletin 805 Style A switch with latch and guard covering both top and sides.

ALLEN-BRADLEY
MOTOR CONTROL
QUALITY

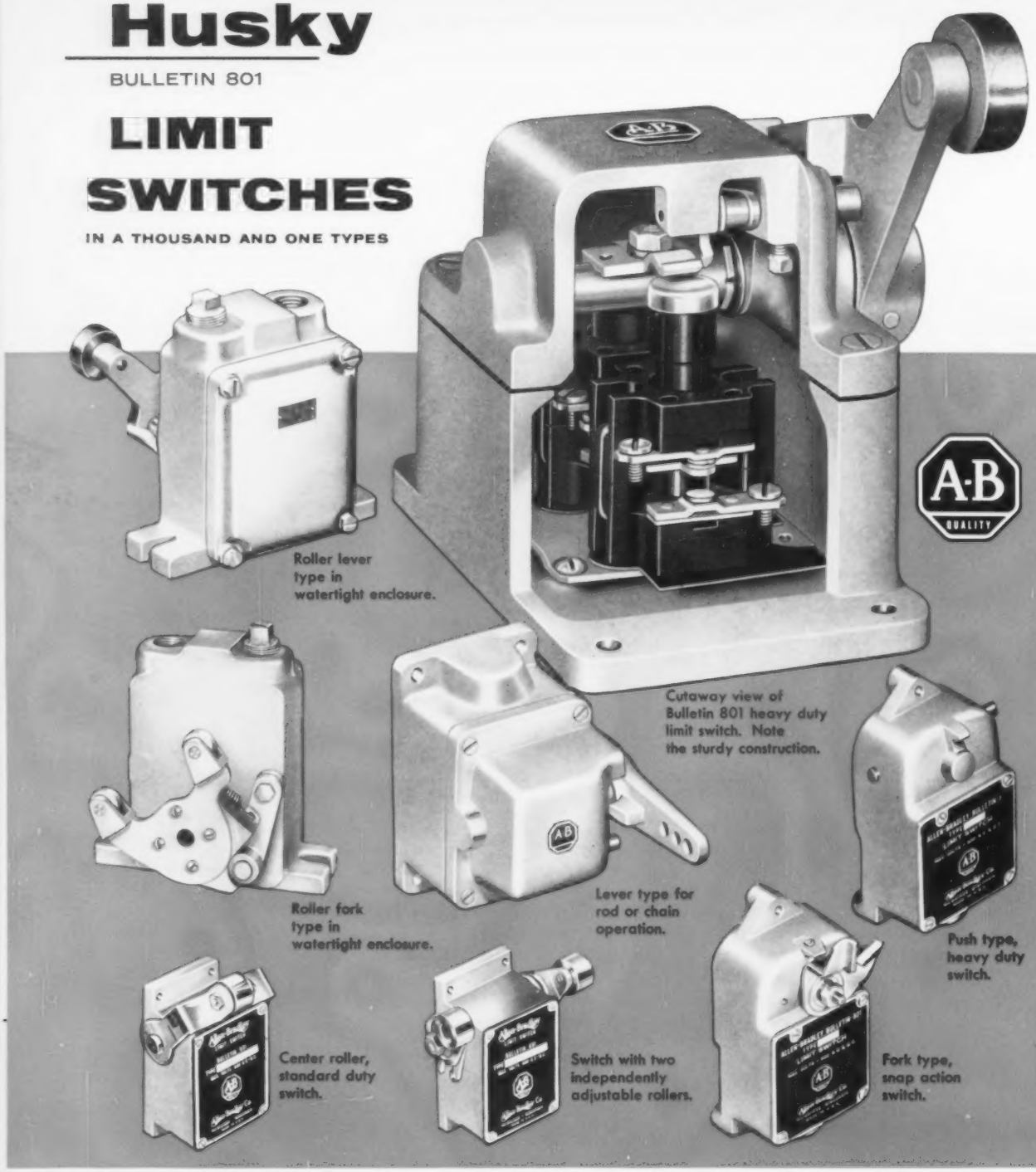
1-58-MR

Husky

BULLETIN 801

LIMIT SWITCHES

IN A THOUSAND AND ONE TYPES


A-B
QUALITY
Roller lever type in watertight enclosure.
Cutaway view of Bulletin 801 heavy duty limit switch. Note the sturdy construction.
Roller fork type in watertight enclosure.
Lever type for rod or chain operation.
Push type, heavy duty switch.
Center roller, standard duty switch.
Switch with two independently adjustable rollers.
Fork type, snap action switch.

From among the hundreds of Allen-Bradley Bulletin 801 general purpose limit switches, you're sure to find your exact requirements. There are 21 different contact arrangements available, including types with single or multiple poles, N.O. and N.C. contacts, spring return or maintained contacts, with either a slow or snap action mechanism. It will pay you to know this *quality* line of limit switches. If you do not already know this quality line, let's get acquainted. Write for the complete story.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

ALLEN-BRADLEY
MOTOR CONTROL
QUALITY

1-58-MR

Stainless Steel
cutting information . . .

*Don't dawdle when sawing

SOME MACHINISTS (the slow, careful type that are so hard to find) like to saw metal very slowly. These men remember old instructions about overheating the blade or the metal, and they worry about destroying the "temper."

Not so with the austenitic grades of Stainless Steel (like the 300 series). These steels harden when they are worked. If you dawdle when sawing one of these steels, it will harden right ahead of the blade, and you'll swear the saw blade has lost its teeth.

All this talk leads to the simple suggestion: When sawing Stainless Steel, use the recommended speed and cut boldly, without dawdling. It will save time, tempers and saw blades.

Stainless Steel fabrication is not difficult, but it *is* different. So why not have the last word in fabrication techniques right in your desk? Write on your company letterhead for a copy of our 130-page "Stainless Steel Fabrication Book." Address United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

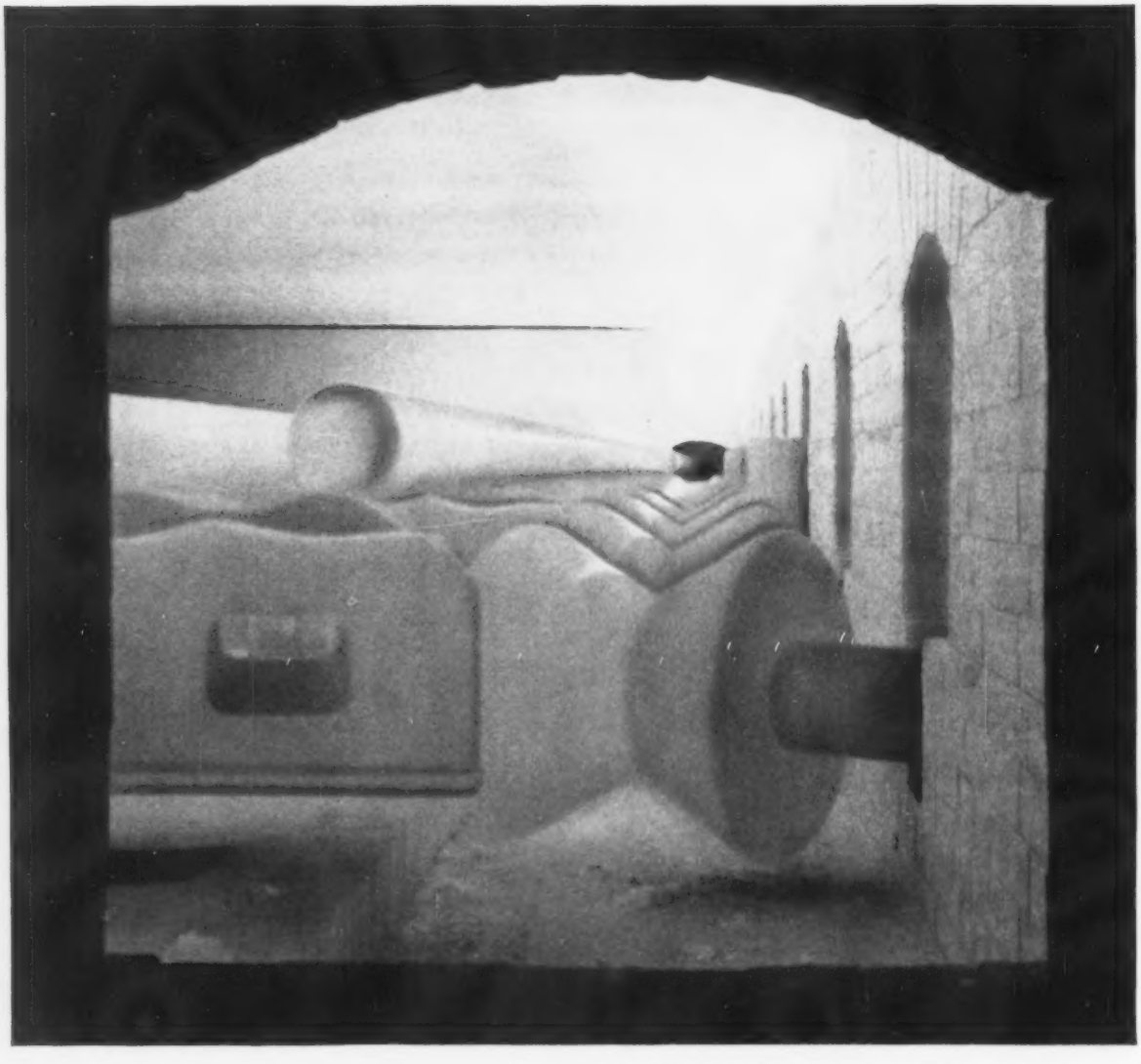
UNITED STATES STEEL CORPORATION, PITTSBURGH
AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS
PIPE · TUBES · WIRE · SPECIAL SECTIONS

UNITED STATES STEEL

USS

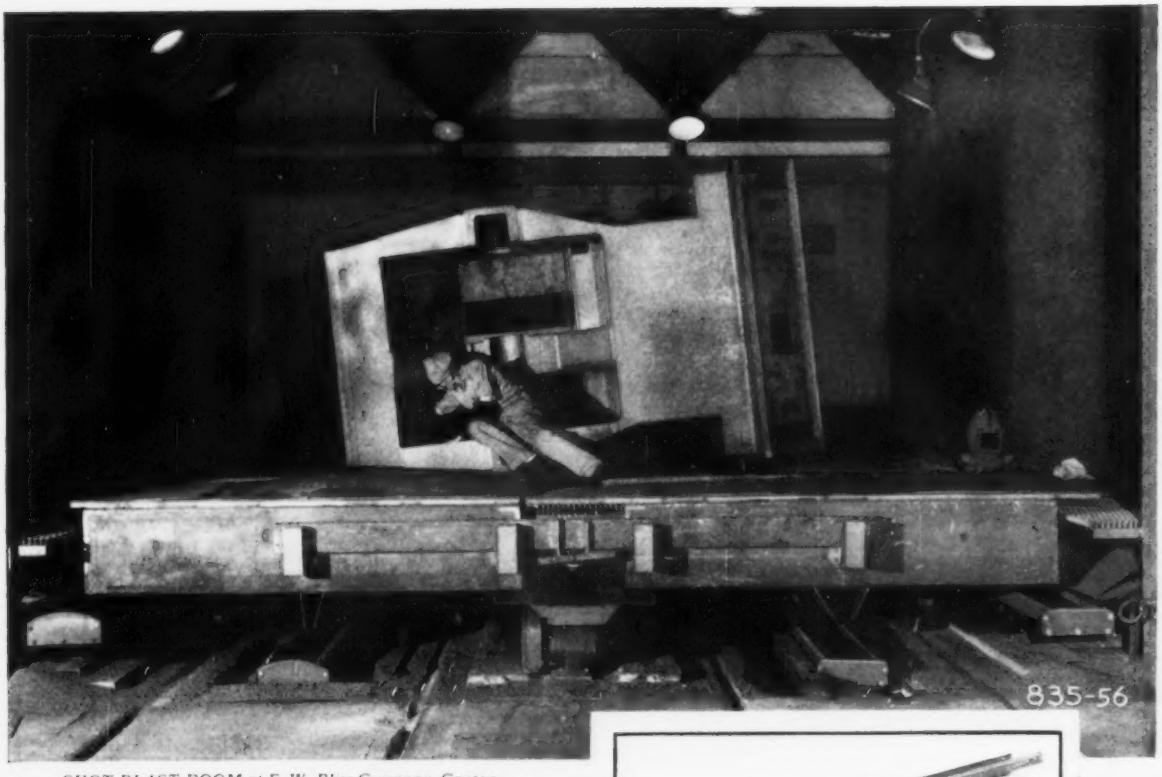


Interior of a high temperature, hearth type Gas furnace specially designed for heat treating high strength steel casing

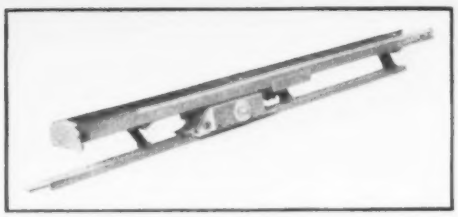
J&L speeds production, decreases costs . . . thanks to *GAS*

This Gas furnace at Jones & Laughlin Steel Corporation, Aliquippa Works, Pennsylvania, assures high strength characteristics formerly attained by adjusting the chemical composition of the steel. With Gas, J&L speeds production of special high strength seamless tubular products. Heat treating these products with Gas also saves tons of strategic materials like manganese, molybdenum and chromium, formerly used in the production of high strength seamless pipe.

For information on how Gas can help you with your production problems, call your Gas Company's industrial specialist. He'll be glad to discuss with you the economies and outstanding results you get with Gas and modern Gas industrial equipment. *American Gas Association.*



SHOT BLAST ROOM at E. W. Bliss Company, Canton, Ohio. Jeffrey LMV Conveyors, furnished through Northeastern Supply Company, gather shot and carry it back to screens and pressure tank for re-use.



Another good spot for time-saving, cost-saving

JEFFREY LMV CONVEYORS

In all kinds of plants, the handling of light materials can be speeded up, made simpler, more efficient and economical . . . with right-from-distributor-stock Jeffrey LMV Conveyors. Compact LMV mechanical vibrating units are quickly custom-sized for your installation . . . ready for next-day delivery and easy for plant personnel to install.

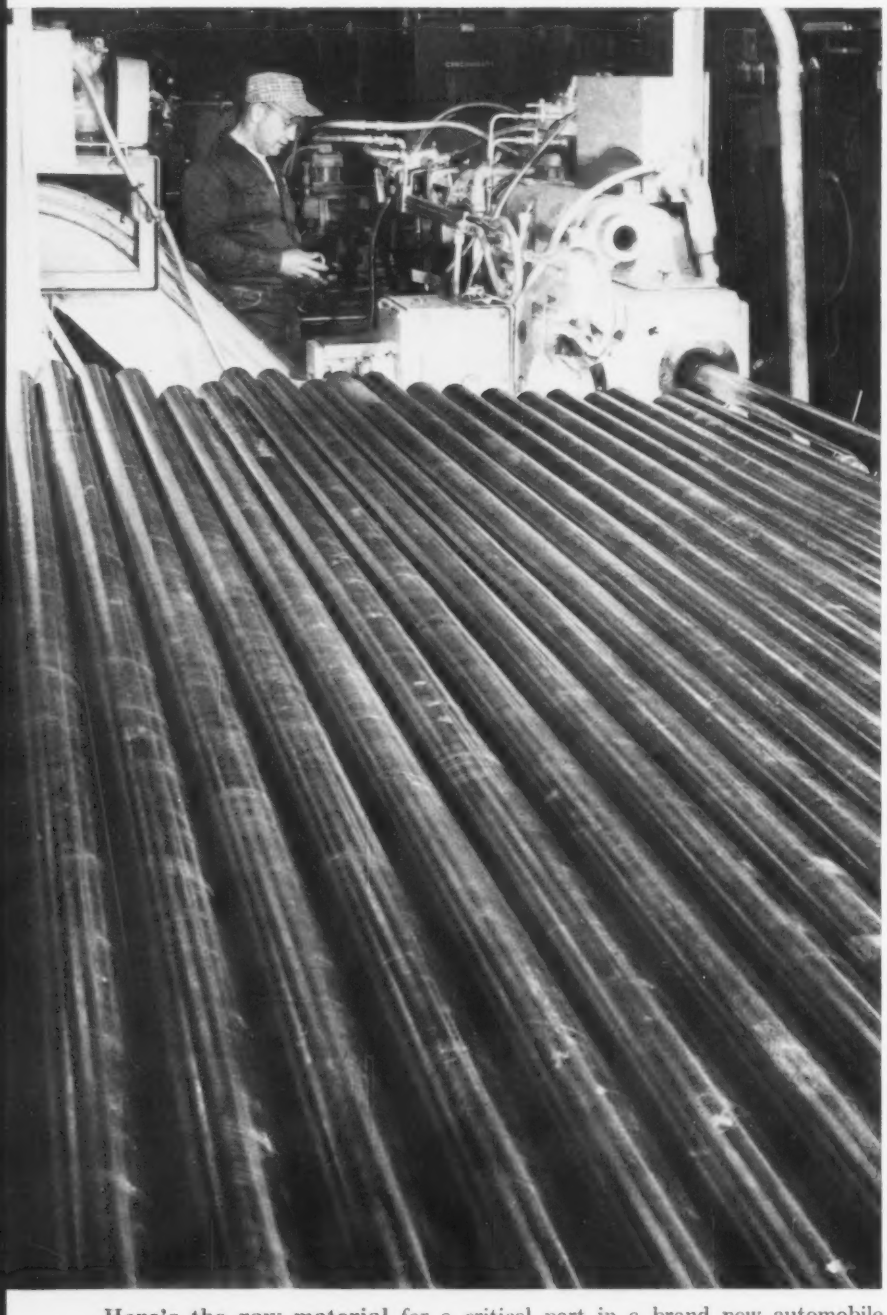
In shot blast room above, five 12″ x 25′ 3″ LMV units beneath roll-in platform automatically gather shot. A 26′ 3″ unit along the back carries it to screens and pressure tank for re-use.

Jeffrey LMV Conveyors are inexpensive, built for round-the-clock service and quiet in operation. They provide efficient, automatic handling of all types of light materials . . . give long trouble-free service. Get complete information from your distributor or write The Jeffrey Manufacturing Company, 925 North Fourth Street, Columbus 16, Ohio.

JEFFREY

CONVEYING•PROCESSING•MINING EQUIPMENT...TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

Brand New Transmission in 1958 Cars Uses Pittsburgh Steel Tubes For 3 Key Parts



Here's the raw material for a critical part in a brand new automobile transmission for 1958. These seamless mechanical tubes, a product of Pittsburgh Steel Company, will be cut to size on the machine in the background and processed into shafts for grade retarders.

Developing and producing a new transmission for a leading car challenges suppliers as well as the automaker himself.

Pittsburgh Steel Company's seamless mechanical tubes successfully met such a challenge by making good on three critical parts for a new transmission making its debut in 1958 models.

Ability of Pittsburgh Steel's tubes to meet this auto manufacturer's high requirements and rigid testing assures tube users in other fields of high, uniform quality.

Tubes from the mills of Pittsburgh Steel are used for these transmission parts:

1. Convertor Reaction Shaft—This shaft takes the torque (turning force) built up by the torque convertor and transmits that torque to the gears.

The convertor reaction shaft is made of seamless mechanical tubing with an outside diameter of 2.219 inches and an inside diameter of 1.505 inches. It is cut to size, centered, given centerless grinding, heat treated and broached—or sized—to a tolerance of .001 inch. Welding and final processing follow.

2. Grade Retarder Shaft—This part is a new feature in auto transmissions. It gives cars a new driving range which improves control on steep downgrades and on slippery surfaces without shifting gears.

The shaft is made of tubing 2.375 inches outside diameter and 1.531 inches inside diameter.

3. Front Pump Driven Gear—This gear is an essential part of the new transmission's hydraulic control system. It maintains correct oil circulation and pressure within the transmission.

The finished gear, measuring $4\frac{3}{16}$ inches o.d. and approximately $\frac{5}{8}$ inch on the i.d., has 36 gear teeth. The teeth are broached simultaneously on a vertical broacher.

All three parts are made from carbon steel seamless mechanical tubing which is cold drawn and finished to

Convertor reaction shafts, made from Pittsburgh Steel's seamless mechanical tubing, are assembled into transmission cases at this station in an automaker's huge plant. The shaft transmits torque to the gears.

exacting specifications. The automaker who chose Pittsburgh Steel's tubing for three transmission parts carefully spelled out his specs for fine grain structure, machinability and weldability.

Those specifications were met by skilled tube mill men so that finished tubes were uniform—from length to length and from one shipment to another.

A measure of their skill is demonstrated by broaching which gives tubing grain structure a critical test. Rejects from peeling or chipping drop with Pittsburgh tubes.

Machinability also is a severe test. In operations where tolerances are held to one-half of one thousandths of an inch, good machinability results in even, smooth production of parts which will pass sharp eyes of inspectors.

Welding operations carried on in automated lines can't be a haphazard operation or one in which quality of welds isn't uniform. Here again Pittsburgh Steel tubes keep production flowing smoothly and produce welds which hold up in field service.

Whether you're making automobile transmissions, hydraulic cylinders, axles or any other product requiring good tubing, you'll profit when you turn to Pittsburgh Steel. Skill of the men in the mill, modern equipment, engineering and metallurgical service available all combine to give you a satisfactory product—one backed by service and dependability.

Act today to get better tubes and service. Telephone or write the nearest district sales office listed below. You'll be glad you did.

Coming off an automated production line, these gears will be assembled into a front pump on a new type of auto transmission.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Cleveland Tool & Supply Co.
Cleveland, Ohio

Drummond McCall & Co., Ltd.
Montreal, Quebec, Canada

Edgcomb Steel Company
Philadelphia, Pennsylvania

Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.

Perry Kilsby, Inc.
Los Angeles, California

Mapes & Sprowl Steel Co.
Union, New Jersey

Metal Goods Corporation
St. Louis, Missouri

Miller Steel Company, Inc.
Hillside, New Jersey

A. B. Murray Co., Inc.
Elizabeth, New Jersey

C. A. Russell, Inc.
Houston, Texas

Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois

Solar Steel Corporation
Cleveland, Ohio

Steel Sales Corporation
Chicago, Illinois

Tubular Sales
Detroit, Michigan

Ward Steel Service Company
Dayton, Ohio

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta, Chicago, Cleveland, Dallas, Dayton, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Tulsa, Warren, Ohio

CRAWFORD H. GREENEWALT

"$22,800,000 Invested in U.S. Savings Bonds During First Year of Thrift Plan . . ."

"Du Pont employees are saving about $23,000,000 each year in U.S. Savings Bonds through the Thrift Plan established by the Company in 1955. Well over 60,000 du Pont people now are purchasing U. S. Savings Bonds through payroll deduction on a regular monthly basis."

CRAWFORD H. GREENEWALT,
President, E. I. du Pont de Nemours & Co., Inc.

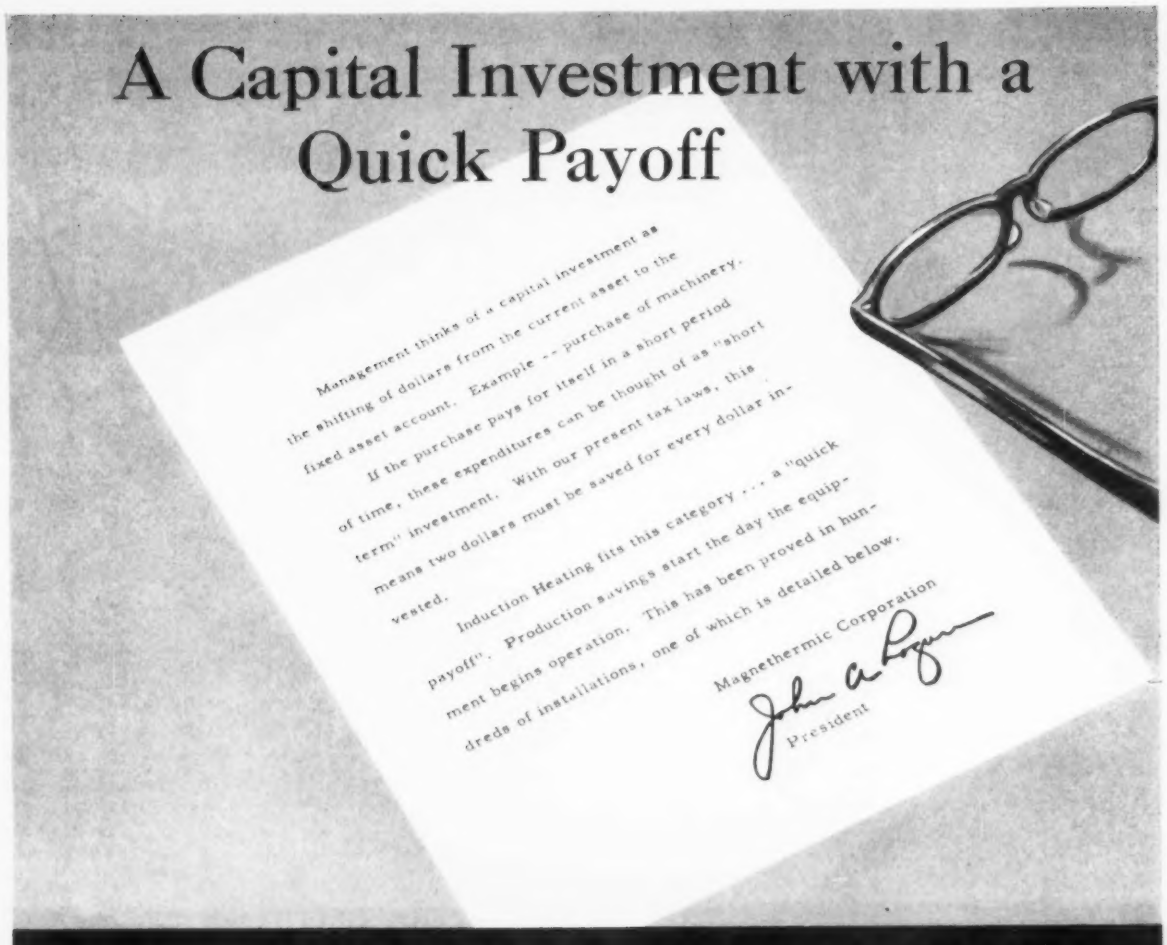
Here's how the du Pont thrift plan works: Employees save part of their earnings each month by payroll deductions to buy U.S. Savings Bonds, and the Company contributes one-fourth as much to buy du Pont common stock for them. The bonds are held for them by a bank and are delivered to them in annual installments, beginning four years after they join the Plan. The bank also delivers shares of stock to them when they are due.

Large or small, every company can give their employees the advantages of the Payroll Savings Plan. Installation of the Plan is simplicity itself. A Treasury representative will give you all the assistance you need to introduce the Plan or build enrollment in an existing Plan. Write: Savings Bonds Division, U. S. Treasury Department, Washington, D. C. for complete information.

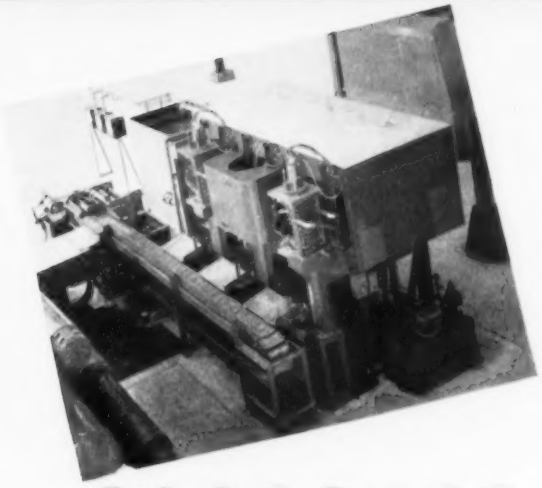
The United States Government does not pay for this advertisement. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

The IRON AGE

A Capital Investment with a Quick Payoff


Management thinks of a capital investment as
the shifting of dollars from the current asset to the
fixed asset account. Example -- purchase of machinery.
If the purchase pays for itself in a short period
of time, these expenditures can be thought of as "short
term" investment. With our present tax laws, this
means two dollars must be saved for every dollar in-
vested.
Induction Heating fits this category . . . a "quick
payoff". Production savings start the day the equip-
ment begins operation. This has been proved in hun-
dreds of installations, one of which is detailed below.
Magnethermic Corporation
President

MAGNETHERMIC INDUCTION HEATING SAVES DOLLARS



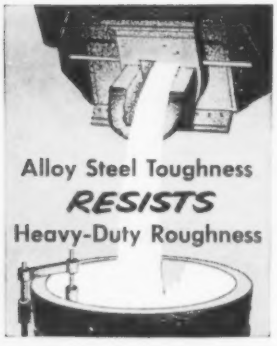
Gross Profit Increased $170,000 with Magnethermic Induction Heating Equipment

To preheat stainless steel billets, one plant replaced a conventional salt bath furnace with a Magnethermic Induction Heater at an investment of $50,000.

Result—an increase in gross profit of $170,000 per year, based on a twenty per cent production increase and a savings of $50,000 on maintenance.

Your inquiry will receive prompt, intelligent attention.

MAGNETHERMIC®
CORPORATION
3990 SIMON RD. • YOUNGSTOWN 7, OHIO



Alloy Steel Toughness
RESISTS
Heavy-Duty Roughness

DRIVE AXLE

Model "660" Motor Grader is built by Adams Division, LeTourneau-Westinghouse Company, Indianapolis, Ind.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

DESIGNED FROM ALLOY STEEL

Shrugs Off Fatigue, Terrific Torque, High Impact Load

Motor graders built by Adams Division of LeTourneau-Westinghouse Company are known throughout the world for quality and dependability.

A good example of the company's constant effort to improve this quality and dependability can be found in the grader's full-floating, two-section drive axle—considered to be the most vulnerable part in the entire unit. It is subjected to terrific torque from an eight-speed, constant-mesh transmission. Impact load is often extreme.

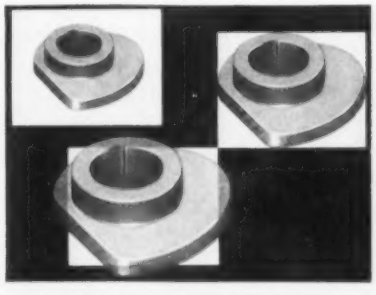
Company engineers and metallurgists spent thousands of hours on research and field testing of all types of steels to find one that would reduce ultimate fatigue in the axle to an absolute minimum.

They eventually settled on Republic Hot Rolled 4340 Alloy Steel. This fine steel not only resists fatigue, but also is able to take a high torque without a permanent set. Fatigue failure is now practically non-existent.

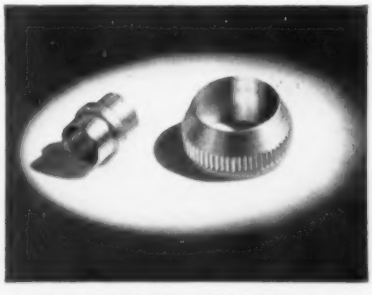
Alloy steels provide an outstanding combination of qualities essential to designing smaller sections to move or carry heavier loads with no sacrifice of strength or safety. They resist fatigue, shock and stress. Respond uniformly to heat treatment, producing hard, wear-resistant surfaces around tough cores. This tough, integral structure provides greater strength with minimum weight.

Specify Republic Alloy Steels for your jobs where strength and toughness must resist heavy-duty roughness. We offer you the services of our experienced field metallurgists to help you get the most from these versatile steels at the lowest possible cost. There's no obligation. Just mail the coupon.

COMPLETE DESIGN, engineering and fabricating facilities go to work for you as an extension of your plant when you have your stamped and drawn parts fabricated by Republic's Pressed Steel Division. This truck shaft bracket is one example of a wide variety of steel parts mass produced to specification at the lowest possible cost. Send coupon for Booklet Adv. 681.



DIE AND PART DESIGN PROBLEMS are reduced by 3 new grades of Republic Iron Powder with *Controlled Dimensional Factor.* In the presence of copper, these powders—depending on type—can be made to grow, remain stable, or shrink, within acceptable limits. Complete information on Type "G" for growth, Type "N" for normal, Type "S" for shrinkage are contained in Booklet Adv. 763. Write for it.



DESIGN FLEXIBILITY PLUS HIGH STRENGTH are secured by Flodar, Inc., Cleveland, Ohio, through use of Republic Cold Drawn Leaded Alloy Steel for these hydraulic fitting parts. Compared with non-leaded alloy, machining speeds were increased 200%, with negligible scrap loss. Also, a fine finish and excellent tool life are secured, plus the strength needed to withstand high-compression loads. Send coupon for facts.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. C-2829-R
3104 EAST 45TH STREET • CLEVELAND 27, OHIO

☐ Have an Alloy Steel Metallurgist call.
Send more information on:
☐ Stampings (Booklet Adv. 681) ☐ Iron Powder (Booklet Adv. 763)
☐ Cold Finished Leaded Steel Bars

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

Here's a system that spells safety – nothing to trip over, no congestion – no heavy handling

Trucks containing motor sub-assemblies, move freely and constantly from work tables to the next process.

Special "Y" type device at top of truck mast automatically engages with the trolley rod moving on the Landahl Chainless Conveyor. Manual release at discharge station releases the truck. Let an experienced Landahl engineer help with your conveyor problems. Write for Bulletin LS-2.

LANDAHL CONVEYOR DIVISION

AMERICAN MONORAIL

ENGINEERED MATERIALS HANDLING

OVERHEAD HANDLING EQUIPMENT

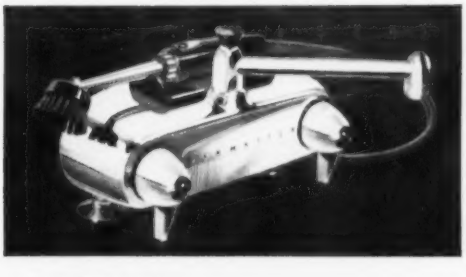
13103 ATHENS AVENUE
CLEVELAND 7, OHIO

MEMBER OF MATERIALS HANDLING INSTITUTE AND MONORAIL MANUFACTURERS ASSOCIATION

FACT: *Copper and Brass . . . today's best metal bargains!*

Competitive analysis of metal costs in manufacturing "Dishmaster" dish washer device switched manufacturer back to brighter, more attractive brass and away from plated steel and other substitutes.

PROOF: *Manville Manufacturing switches back to Brass for a better product at lower cost . . . drops steel!*



The "Dishmaster" made by Manville Manufacturing Co. of Pontiac, Michigan, includes many small parts again being made of brass. Direct comparison of costs with cadmium-plated steel showed that brass was once again the bargain buy in metal. For example, cost of the retaining ring shown here was reduced $11.50 per thousand when the manufacturer switched back to brass! Comparable component savings are being made all down the line! (Based on October '57 costs of brass vs. steel.)

There's no excuse for using substitutes for copper and brass; the genuine article is today's best bargain in metals! Your nearest Chase man can show you specifically how Chase alloys—made of Kennecott copper—can fit into your production picture. Contact Chase locally or at Waterbury 20, Connecticut.

Chase

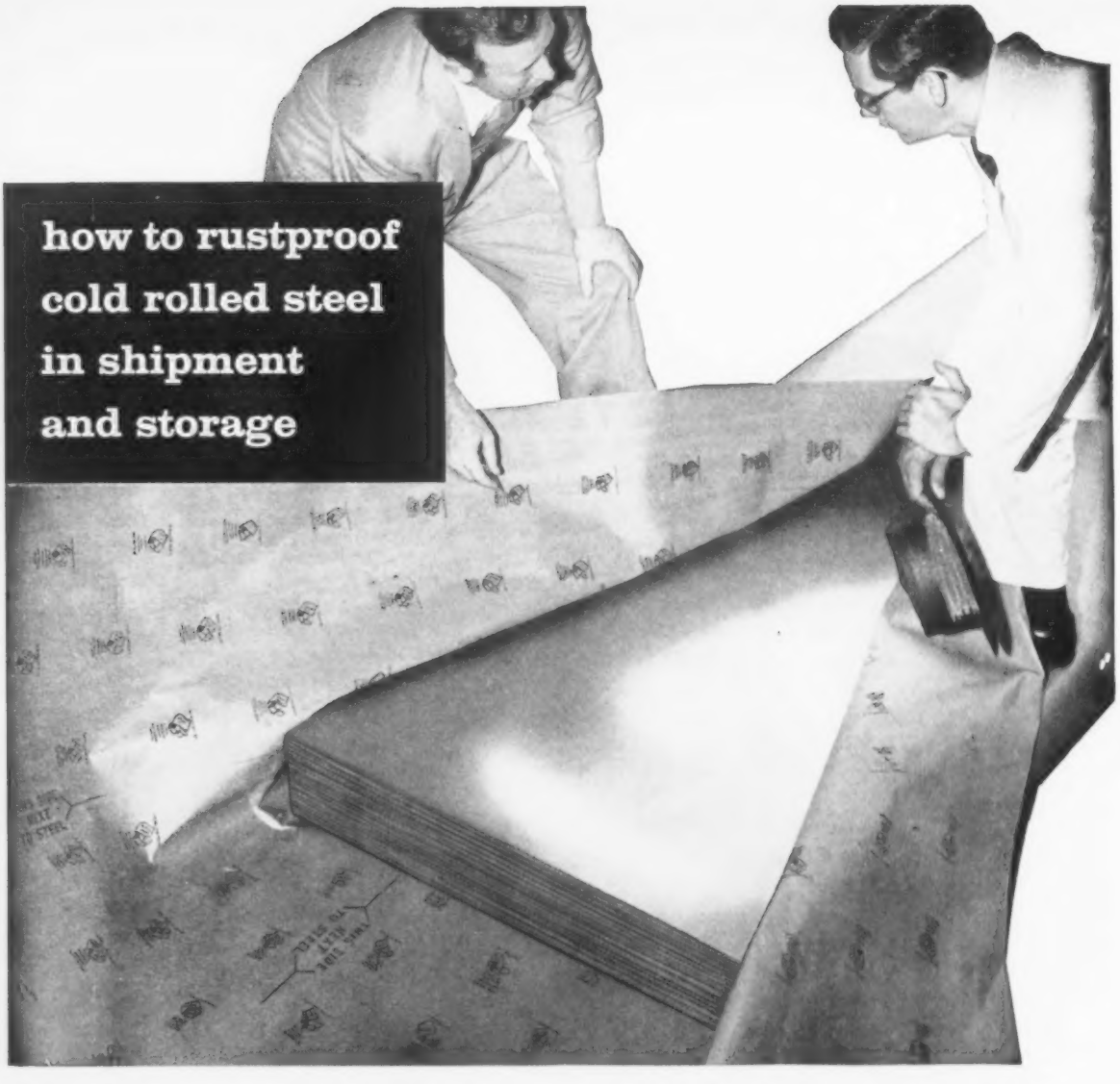
BRASS & COPPER CO.

WATERBURY 20, CONNECTICUT

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The Nation's Headquarters for Brass, Copper and Stainless Steel

Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York (Maspeth, L. I.) Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury



how to rustproof cold rolled steel in shipment and storage

Proved by actual test! Unwrapped steel rusted within a few hours. Identical steel wrapped in Ferro-Pak showed no signs of rust . . . even after several months. Non-toxic chemical vapors from Ferro-Pak coat the steel with an invisible film that makes it impossible for rust to get the slightest foothold.

Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong, yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 4803 South Whipple Street, Chicago 32, Illinois.

How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.

How to rustproof black plate—On this light gauge, dry, uncoated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity soars!

FERRO-PAK®
by Cromwell
For over 38 years—
"Paper Engineers" for Steel

Coat Castings Electrically

A new painting apparatus coats foundry castings with electrified paint. Charged droplets of paint feed from a high-speed disk to seek metal surface on which to ground the electrical charge. Savings come in lack of overspray and no paint wastage. Castings travel on a looped conveyor around the atomizing disk.

Study Ionic Propulsion

Heavy federal research on radically new space-drive systems is in the works. Ionic propulsion for space ships is marked for intensive study. Scientists know we don't need ultrapowerful thrust at extreme heights. But the thrust must be long-lived. With new money from Congress, the government will search for the best system.

Liquid Honing

Titanium jet engine blades must retain critical tolerances during removal of heat treat scale. A new liquid honing machine does the job at 320 blades an hour. The biggest innovations come in automatic handling of blades and in a new oscillating nozzle.

Gold Prevents Oxidation

Recent research has further improved the protection of molybdenum against oxidation at elevated temperatures. Combinations of electrodeposited coatings of nickel and chromium, while providing partial protection, were never entirely adequate. Reason: pinholes permitted vaporization of base metal. A thin layer of electrodeposited gold now appears to be solving the pinhole problem.

Need Markets For Uranium

The Atomic Energy Commission has told miners and millers of uranium that it's not interested in further expansions. Current commitments are adequate for the next 10 years. AEC says it's time to seek new markets. But it won't be easy. A number of years ago, before the atom was split, a large and diversified company sought applications for substantial amounts of uranium from the tailings of its vanadium operations. None could be found until the uranium boom arrived.

Linepipe Vote

Look for oxygen converter steel to be approved for use in pipeline this spring. At that time, American Petroleum Institute will take action on a tentative specification for use of converter steel in seamless and welded linepipe. A preliminary ballot forecasts favorable action.

Profit Sharing

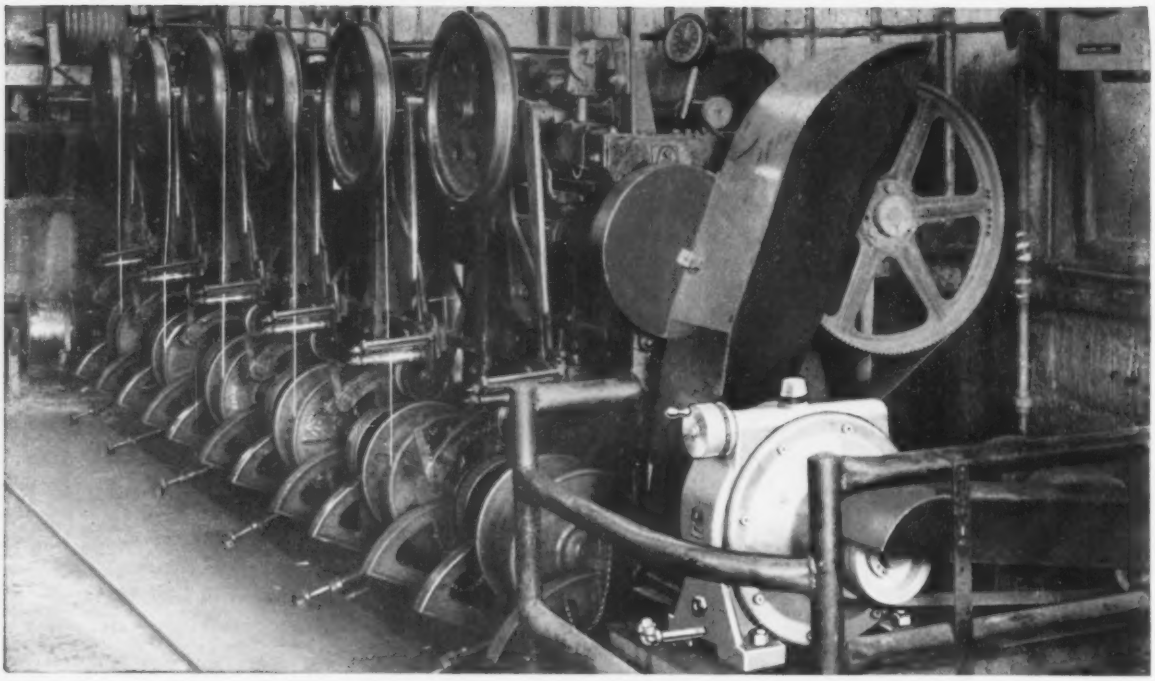
Perhaps the UAW has been taking note of this: Profit sharing, as a means to combat wildcat strikes and Communist influence in labor unions, is proving successful in France and other European countries. Some manufacturers offer a substantial bonus payable at the end of each strike-free 6-month period. The result has been growing labor stability, waning Communist influence.

Foundry Fights Back

An aggressive approach to the business slump is bringing in orders for a major foundry in the Midwest. In a series of design conferences, the firm's metallurgists and engineers tell both actual and potential customers what's new in materials and techniques. They point out where castings can replace costlier forgings and weldments, also show how to design castings for bigger savings.

Defense to Spur Rise

Here's how government buying of defense items will rise this year: In 1957, total spending for military hardware was $12.1 billion. This year, add another $5.2 billion for a total of $17.3 billion. Look for more than half to be spent in the first 6 months. The White House calculates the rise will boost overall business activity.



CLEVELAND SPEED VARIATOR

winds 4 reels of cable simultaneously—where old drive slipped with 2 reels

THIS machine winds tin-plated wire used in the manufacture of cable. The Cleveland Speed Variator on it replaced a drive of the same capacity with which there was slippage and frequent maintenance.

With the new Cleveland, it was immediately possible to run simultaneously 5 reels of the heaviest wires, as compared to only 2 with the old drive. In fact, the 10 HP drive motor soon proved unequal to the 5-reel load which the Cleveland was handling without slippage. Now driving 4 reels of the heavy wire, the machine is doing double the work it formerly handled.

Wherever you need a variable speed drive, consider Cleveland. Write for Bulletin K-200. The Cleveland Worm & Gear Company, Speed Variator Division, 3282 East 80th Street, Cleveland 4, Ohio.

Note these major advantages of the Cleveland Speed Variator

1 An extremely compact unit, with input and output shafts in line and rotating in the same direction.

2 Operable at any input speed up to 1800 rpm—either clockwise or counterclockwise rotation.

3 Rated for constant horsepower output over a 9:1 or 6:1 range; or for constant torque over a 6:1 range.

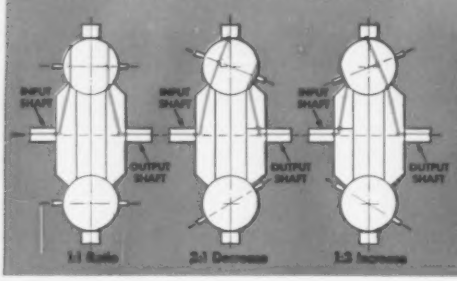
4 Infinitely variable output speeds over the entire range of adjustment.

5 No slippage—positive, automatic torque adjustment in direct proportion to the loads encountered.

6 Ample bearing support on both shafts for overhung pulleys.

7 Long life and minimum maintenance through absence of belts and complicated linkages.

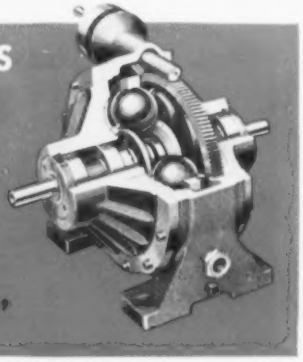
HOW THE CLEVELAND SPEED VARIATOR WORKS



Power is transmitted from input shaft to output shaft through alloy steel driving balls which are in pressure contact with discs attached to the two shafts.

Relative speeds of the shafts are adjusted by changing the positioning of axles on which the balls rotate (diagram, right, shows cutaway Variator with hand regulating wheel).

"It's the Drive That's on the Ball."



SPECIAL REPORT

Can We Halt the Plague Of Periodic Inventory Buildup?

By F. R. Palmer—President, Carpenter Steel Co., Reading, Pa.

Inventory liquidation is a major cause of recessions.

Steel users, like others, feel they have to over-buy during booms. As a result, steel operations fall faster than those of steel users. But the latter always pay a stiff price to liquidate.

Better planning is needed during high-demand periods.

■ At a time like this it may sound naive, if not actually fatuous, to talk about inventory accumulation, particularly in steel.

And yet this may be the best time to do so. The low operating rate of the steel industry today is due partly to the fact that steel users are working off excessive inventories.

The Customer Pays—Steel companies and their employees are taking the brunt of the current drive to liquidate inventories. But steel users are paying for it in two ways: (1) In the cost of carrying excess inventories; and (2) in the cost of building and carrying steelmaking capacity that is fully used only during short inventory-building periods.

According to an IRON AGE survey, (The IRON AGE, Sept. 12, 1957, p. 83) it costs the average metalworking plant $19.37 a year to carry $100 worth of steel in stock. And with new integrated steel capacity costing at least $300 a ton, the high cost of excessive capacity must be shared by mills and their customers.

Here's What Happens—Suppose the ABC Mfg. Co. is operating at 80 pct of capacity, and at this level cuts up 80 tons of steel a month. Let's further assume it is their practice to keep one month's supply of raw steel on hand and that the delivery lead time of their steel supplier is one month. Their total inventory and commitment is 80 tons in process, plus 80 tons in the racks, plus 80 tons on order, or 240 tons.

Now let's assume their business picks up to 100 pct of capacity. Theoretically, their steel picture would become 100 + 100 + 100 or 300 tons. Not only does this call for 25 pct more steel each month from the steel supplier, but somehow an extra 60 tons must be found to fill the new inventory pipeline. The chances are that the same impetus that puts ABC back to 100 pct operation is affecting most other metalworking plants at the same time, and everyone wants the mill to increase his shipments and fill his pipeline. As a result, a backlog of orders accumulates at the steel mill and deliveries are extended to perhaps 60 or 90 days.

The Buyer Reacts—Faced with extended deliveries and perhaps a few broken promises, the buyer feels it would be safer to carry two months' raw steel on hand, so he orders an extra hundred tons. Others do likewise, and by a sort of leapfrogging process, deliveries may move out in extreme cases to six months.

Now, what is the picture? There is 100 tons in process, 200 tons in the racks, and perhaps 600 tons on order—a total of 900 tons. It takes many months to stabilize on this new and highly extended level,

THE AUTHOR, Frank R. Palmer, was persuaded to prepare this article for The IRON AGE on the understanding that it is not a panacea piece. He writes from a background of engineering, sales and metallurgy in the hope that it will be considered as a laboratory report of an experiment; a promising experiment, but one that has not as yet been completed. It is based in part on a talk delivered by Mr. Palmer to an American Iron and Steel Institute regional meeting in Philadelphia. Here (left) he chats with F. W. Evans, production manager.

"If we can solve this problem the savings will be tremendous."

during which time the steel mill has been producing considerably more steel than his customer was using. Now the cycle turns downward and ABC is back to 80 pct operation again.

Flood Stage—The steel on order keeps rolling in at a time when the buyer wants to start cutting back, and by the time top management at ABC sends out the order to reduce inventories to a 30-day supply, there are about 360 tons of excess steel on hand. At 80 pct operation, this means more than four months before normal purchasing can be resumed.

We have assumed that ABC does not carry an inventory of semi-finished and finished parts. Frequently they do, and this same phenomenon repeats itself at each stage, so that, in extreme cases, steel buyers may be out of the market for as much as a year.

Case Study—If this hypothetical example seems a little exaggerated, let's look at a picture taken from real life during the recession of 1954. In the "Cup and Saucer" chart the upper, (dotted) line shows the cyclical swing of the metal fabricating industry based on the Federal Reserve Index. Note that the total dip in this index was about 14 pct.

The lower curve shows the activity by quarters of steel production at the Carpenter Reading mill—drawn to the same scale. In this case, the decline amounted to 40 pct.

If we move the "Saucer" down, as in the adjacent chart, the accumulation-liquidation picture is quite obvious.

A Plague?—Steel has been used for illustration, but this same accumulation and liquidation goes on in many raw materials and component parts. It is epidemic. It is scarcely an exaggeration to call it a plague.

Unemployment insurance and SUB are only two of the byproducts of this plague. For the purchaser, it ties up cash—sometimes at most embarrassing times. It is a headache for everybody, and it would represent tremendous savings to all concerned if a way could be found to mitigate it. We at Carpenter tried this during the accumulation cycle in 1955-1956 because we realized that little, if anything, could be done about it during the liquidation portion of the cycle.

We could see that much of the fault during past inventory accumulations had been our own. As our backlog built up, we had to quote longer and longer deliveries—asking cutomers to look further and further ahead.

No Crystal Gazer—It stands to reason that a buyer can place orders much more realistically on a 30- or 60-day lead time than he can at 6 months or even 120 days. Trying to out-guess the economic cycle, international affairs, the possibility of strikes, etc., the buyer in an expanding market tends to cover his long-range requirements for "plenty of everything."

Furthermore, when the first warning signals of a down turn become evident, he has commitments stretching months into the future. At a time when he would like to be levelling off, he is deluged with shipments ordered many months before. Our first conclusion, therefore, was that if we were going to get anywhere in this program, we would have to keep our lead time from stretching out—a very difficult task.

A Long Cycle—In a specialty steel mill, the usual manufacturing cycle requires perhaps six to eight weeks from melting to shipment on hot-finished products.

During normal times, we carry a bank of unsold billets and other banks of hot-rolled flat or round rods so we can make extra-short deliveries when required.

Six-Month Stretchout — In the past, during inventory accumulation cycles like 1950 or 1953, the demand was so great that our banks of unsold billets and rods almost immediately disappeared and customers' orders lined up ahead of the melting furnace. It was not unusual for deliveries to move four to six months away.

During the 1955-1956 accumulation cycle, however, in our attack on the cup-and-saucer problem, we undertook to maintain our banks of process inventory as essential to keeping normal lead times. This was done by giving a "stock replacement" heat the same standing on the melting schedule as we gave to a customer's order. Thus, every heat used for an emergency shipment was immediately replaced to await the next emergency.

Plan With Customers — We opened our books one quarter at a time, to keep our backlog under control. We made our sales force inventory - conscious. Instead of urging customers to place bigger and better orders further and further ahead, they worked out with each customer his actual monthly needs and then reserved this space in our schedule so that the customer did not need to worry about being crowded out.

Take Care of Emergencies—There is still another fear in the heart of a buyer that must be satisfied if he is to minimize inventory accumulation during the flood tide. Some way must be provided to satisfy emergency requirements—those unexpected contingencies that arise in any manufacturing operation. This was at least partially solved by further increasing our stocks of semi-finished steel — beyond the tonnage necessary to maintain normal lead-time.

Centralize Reserves — This employs the principle of "central reserves" instead of everybody carrying his own individual reserves. It

naturally takes much less tonnage reserved in semi-finished form at a steel mill than it does for a customer to carry an adequate emergency stock in every size and grade that might conceivably be needed.

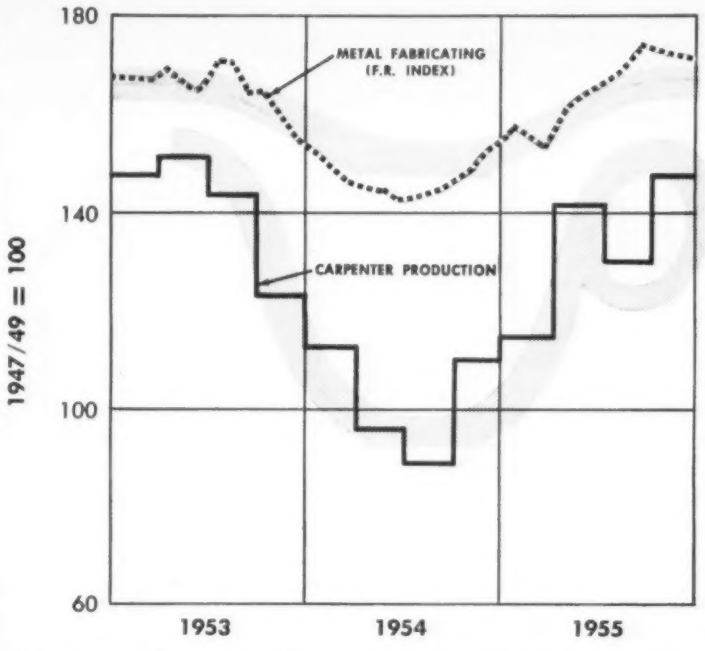
To be sure, an emergency shipment from a mill is not quite as fast as picking up steel from your own inventory. However, judging from our experience, most emergencies can be met with proper planning and cooperation.

On Build-Up—Let's see how all this actually worked out: The results are far from perfect; we hope to do a better job next time, but they are encouraging. During the first half of 1956, we shipped almost exactly the same average tonnage per month that we shipped during the first half of 1953, but we were able to serve some 10 pct more customers without having to short-change anybody.

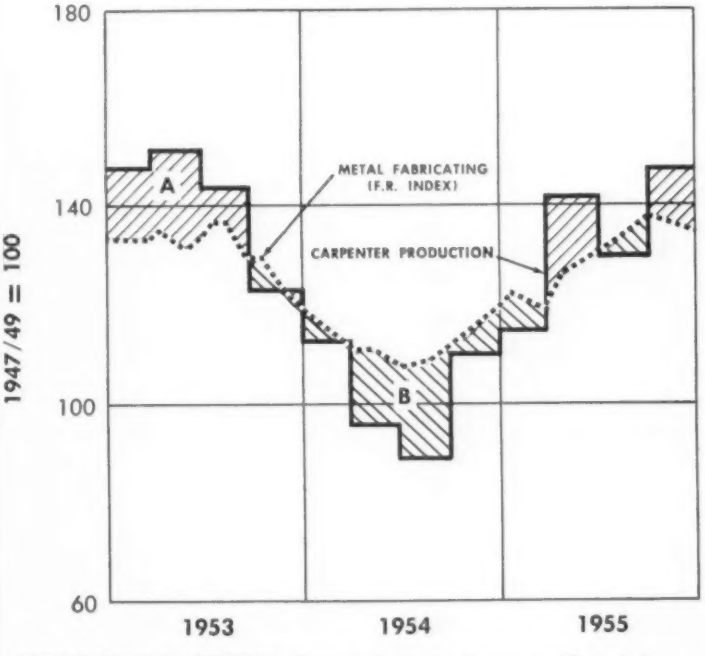
And Cut-Back—It is still too early to tell how extensive will be our dip during the current liquidation. Obviously, the effect will be more evident in the width of the cup than in its depth. There is always some inventory to be liquidated when the cycle turns down. The best we can hope to do is to reduce the size of the pile. If a buyer must liquidate half as big a pile in 1957-58 as he had in 1954, he will still withdraw from the market until his inventory is in line. But he should resume buying according to use much sooner than in the earlier period. This remains to be demonstrated.

No one supplier, no handful of buyers, can do this job alone. It will require the efforts of many producers of specialty steel and other raw materials—and the persuasion of many buyers.

Forgetting for the moment about the direct costs, consider the benefits to all if the sharp employment fluctuations could be flattened out. In our case, as a specialty steel producer, if our dip could be limited to 10 or 12 pct it could be absorbed without laying off a single worker.



WHAT HAPPENS: Cup and saucer effect shows how steel production drops sharply as FRB index of metal fabricating dips slightly.



CHANGING PATTERN: Cause of cup and saucer effect is inventory liquidation. Moving saucer downward shows that excess consumer inventories at "A" were finally used up at "B."

Get Set for Tougher Bargaining

Management Feels Sessions Are Too One-Sided

How management can regain its leadership in labor relations gets more attention.

Speakers at NICB meeting urge a new approach to collective bargaining. — By G. Grant Carr.

■ The long labor - management honeymoon may be over. There is a good chance that 1958 will see a switch from "sweet reasonableness" to a get tough attitude in labor relations by management. Metalworking executives are daily more outspoken in criticizing their own past labor policies. "We just can't sit still for continual wage and fringe boosts any longer" is a frequent comment.

This attitude was widely evident in corridor gossip and executive suite bull sessions at the National Industrial Conference Board's personnel administration meeting in New York last week. While formal panels stressed better techniques of labor cost control at all levels, the informal sessions probed deeper.

Emphasis here was on ways of regaining leadership in labor relations—leadership which many executives feel has been lost to the unions. The big question: How to develop broad labor policies which are fair to all yet more closely geared to business realities?

Back to Two-Way Talks—This new management attitude is not "union-busting" in any sense. Rather, it stems from a deep sentiment that so-called collective bargaining has become too one-sided. And it reveals a mature awareness that one-sided bargaining benefits neither side.

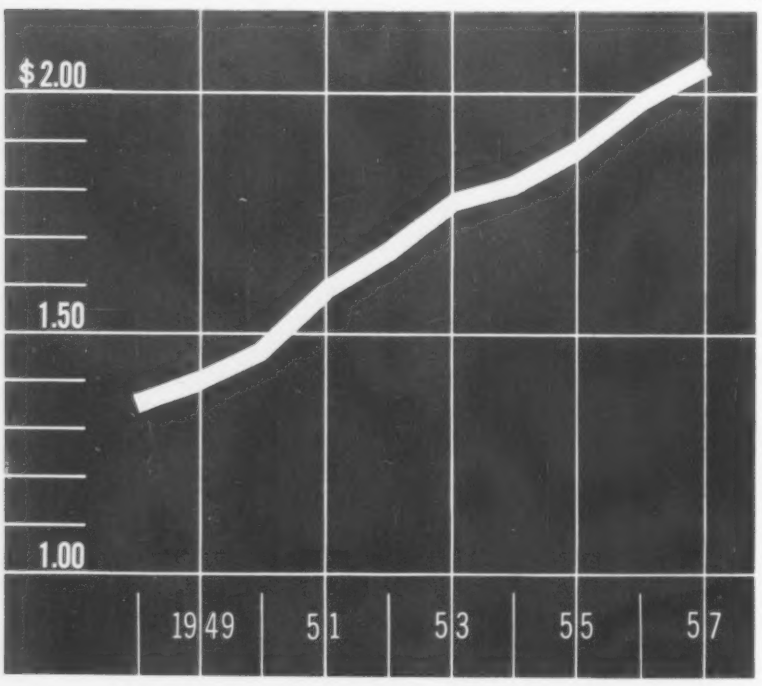
Spotlighting this management attitude was Harold J. Ruttenberg's plea for a new approach to collective bargaining. Mr. Ruttenberg, formerly a steel union organizer and currently president, Stardrill-Keystone Co., protests that both labor and management approaches to collective bargaining are obsolete and harmful to the economy.

True Productivity—Labor's approach, he said, is simply "more." In the last analysis, management has no answer save automation—that is, more efficient machinery. And the inflation since World War II reveals how ineffective this approach has been, he continues. Management has been unable to compensate for wage boosts by higher productivity; price increases have been the only alternative. And labor has been happy to leaving it to management to provide the "more."

Mr. Ruttenberg presented his NICB audience with a detailed proposal centering around an expanded concept of productivity. This new concept would take account of the contributions of both groups—labor and management. His plan would enlist the aid of organized labor in providing still greater productivity and relate wage increases to such contributions. He argues that only such a drastically new approach can prevent further inflation from wage rises and price increases.

The Steady Climb of Labor Costs

Average Hourly Earnings for Production Workers, All Manufacturing



Source: U. S. Dept. of Labor

TOO MUCH COPPER LEFT OVER (Net Tons)

	Production from U. S. ore	Imports crude and refined	Stocks Changes at U. S. refineries
1957*	1,092,000	582,000	+60,000
1956	1,114,285	588,463	+59,091
1955	1,014,442	580,992	+14,446
1954	841,071	584,640	−40,604
1953	948,509	668,311	+30,335
1952	932,629	614,394	−12,670
1951	938,133	483,571	+22,488

* The IRON AGE Estimate

Copper Tariff Becomes an Issue

Mining states congressmen form bipartisan group with a plan for a higher tariff, and higher peril point.

Copper management is still pondering the issue. Independents suffer.—By F. J. Starin.

■ The latest copper price drop, and continued weakness of the market is forcing the tariff issue.

On the legislative front, Rep. John B. Bennett (R., Mich.), was first to introduce a bill calling for a tariff boost. He wants a 4¢ per lb tariff when the price is 30¢.

The current law would collect 2¢ per lb of imported copper when the domestic price is 24¢ or lower.

A bipartisan group of 14 senators and 9 representatives, primarily from mining states, have sponsored a bill asking about the same thing as Congressman Bennett. But they want copper removed from the jurisdiction of the General Agreement on Tariffs and Trade.

Legislative Goal—The extensive backing for a single bill is aimed at avoiding the logjam of bills that was a major factor in preventing lead and zinc from getting a tariff boost law through. And the "jurisdiction clause" would relieve the State Dept. from negotiating concessions to countries hurt by the higher tariff.

On the other side of the fence, David J. McDonald, president, United Steelworkers, says, "No high tariff will bring us peace or prosperity and in no way will it solve the problems in the nonferrous industry."

Management Confers — Top management of U.S. copper companies are planning what stand to take. None has gone on record since the issue-forcing price sag.

Here's what has been said, and what some of the companies are likely to say if and when they are forced to stand up and be counted.

"It would not seem that the problem would be solved by unreasonably high tariff barriers which would only increase the price of copper to the consumer and decrease his desire to use copper," said Kennecott vice president Frank R. Milliken.

Kennecott Asks Study—Officially, Kennecott has not said what it believes is the right answer. But, John C. Kinnear, Jr., general manager of Kennecotts Nevada Mines Div., has suggested the government make a study.

At the American Mining Congress meeting at Salt Lake City, Utah, last September, J. B. Pullen, assistant general manager, Phelps Dodge, proposed a 4¢ tariff when the domestic price falls to 32¢.

Anaconda Silent — Anaconda, with extensive interests in Chile, has remained officially silent. A spokesman declared in his personal opinion copper markets are a world proposition.

The position of Consolidated Coppermines Corp. is probably indicative of the small, independent U.S. mines. Consolidated mines and sells its own copper, but smelting is done by Kennecott, and refining by American Metals Co.

Independents—A. J. O'Conner, vice president and general manager of Consolidated, says his company can compete with any company in the U.S., but not, without protection, against international production. He favors a 4¢ tariff with a 32¢ peril point.

No Time to Waste When Downtrend Comes

When sales suddenly sag, how do you keep costs from becoming fatally high?

Advance planning is part of the answer for many companies today. They keep standby plans ready for periods of retrenchment. When the time comes to cut costs, there is no fumbling for places to chop.

The need for this sort of groundwork was underlined recently by the steel slowdown. Steel operations dropped nearly 40 pct in a year's time and more than 10 pct in one month. For individual mills, the last month slide was even steeper.

In the old days, arbitrary slashes were the answer to sales lags. Every department was told to cut costs 10 or 20 pct and that was that.

Modern management now realizes this approach won't do. Costs must be cut in a thoughtful, selective manner. But this takes time, and shrinking markets can put you in the red overnight.

Pre-Planning Eases Retrenchment

Here are some examples of how companies plan ahead to hedge against possible downtrends.

Selective economies are required to keep operations efficient.—By G. J. McManus.

▪ Most companies have adopted some form of cost pre-planning to ease the pains of a falling market.

One of the most extensive jobs is done by Jones & Laughlin Steel Corp. in its flexible budget system. Operating under this system in 1954, this Pittsburgh company earned $25 million ($3.50 per share) despite a $100 million drop in sales and a 30 pct drop in operating rates.

How It's Done—At the start of a year, J & L sets up separate budgets for every 10 pct interval in operating rates. One budget assumes 100 pct operations, another 90 pct, and so on. Each budget is geared to a different profit margin, starting with the breakeven point and working up.

Each is a comprehensive, detailed plan of action, covering production, plant administration and corporate functions.

In building overall budgets, J & L starts with a product breakdown for various levels. At 80 pct of capacity, so many tons of cold-rolled sheet will be rolled, so many tons of bars, etc. Individual departments figure out the men, the equipment and the time that will be needed to produce their part of the output. Department operations are budgeted and assembled into the overall budget. Adjustments are made to bring costs into line with income and profit margins.

Immediate Action — The final budget series gives J&L a ready-made plan of action for any operating level. It backs up standard cost controls with a running yardstick of department and overall performance. In direct production and to some extent in indirect production, new budgets take effect automatically as operating rates change. Supervisors receive regular reports on how their costs are lining up with budgeted figures.

Even without reports, supervisors appreciate the need for daily economy. Having helped devise a budget for reduced operations, a supervisor knows his costs must drop when his workload eases.

Problem In Administrative—In administrative operations, changes are less automatic. Companies cannot shake up payroll, personnel, and similar departments with every minor and temporary change in business. Management must decide there is a long-term trend at work before new budgets are installed. New operating plans are always ready for the time this decision is made.

Another Pittsburgh company concentrates cost pre-planning on plant operations. National Supply starts with a normal budget, based on five days a week at machinery plants and three shifts a day five days a week at tube mills. In a machinery plant, activity levels are translated into total plant machine hours and cost allowances are pegged to these.

Example at National—If the activity level is 2000 machine hours, for example, a section might be allowed 6 clerks. If activity drops to 1500 machine hours, the allowance might be cut to four clerks. There is no fixed rule on allowance steps; the workload of one department

may vary directly with total activity while another group will be affected only slightly or not at all.

As an example of this, National Supply makes no provision for changes in its engineering force at any of the budgeted activity levels. And most companies today accept the fact that sales effort must be stepped up in slack periods.

Keep Unit Costs Constant—At National Supply's paper mills budget control aims at keeping variable unit costs as constant as possible regardless of volume. Both direct and indirect costs are budgeted on the basis of so many men per turn. For an eight-hour day, a bar mill is allowed so many millwrights, so many operators, etc. This complement does not change as the number of turns is reduced. As far as the budgeted elements go, the cost per ton of steel does not change as the number of turns is reduced.

Budget Director L. Edward Micca at National Supply feels there is a limit to the amount of precise preplanning that can be done. In a billing department, for example, you cannot assume that the workload will drop as fast as sales volume. You may have reduced quantity per order but still have the same number of individual orders.

For the Office — A number of companies have derived standard costs for a wide range of office functions. Mr. Micca feels the expense of such measurement may outweigh any savings. You can't reduce all cost elements to a formula, he says. In some cases you must rely primarily on supervision.

Modern data processing equipment simplifies contingent budgeting significantly. Once a flexible budget system has been installed, electronic units allow you to keep figures current without a prohibitive amount of labor.

Advance planning does not change any of the consideration of cost cutting. Under any method the same difficult decisions must be made. Pre-planning promotes orderly retrenchment by giving more time for these decisions.

Wages, Prices Are Key to Recovery

President's economic report threatens controls if wages and prices get out of hand.

Recovery is expected late this year. Credit called too tight.—By G. H. Baker.

▪ Labor, particularly the United Auto Workers, holds the key to the general business recovery expected in mid-1958, top Eisenhower officials say.

Sources close to the White House say that labor wage settlements this year which exceed productivity increases could block the business recovery Eisenhower economists expect in either the third or fourth quarter of the year.

Prices, Too—But, price increases by industry, which are unwarranted by cost increases, could have the same effect of "aborting the upturn," these economists warn.

Government officials also warn that any new inflationary cycle from higher wages or prices with the resulting consumer resistance may well be "fought by Government monetary officials." Presumably, this would be through direct controls, which would have the effect, they admit, of holding down employment "uncomfortably below the safety point."

"Recession" Banned—In his economic report to Congress, President Eisenhower and his chief economic advisor, Raymond J. Saulnier, purposely refused to use the word "recession" in describing present conditions. But some top officials say present economic conditions are too depressed to even fit the meaning of the banned word.

Here are the highlights of the economic outlook as seen by the president and his top economists:

1. The present recession was caused by a flattening out and then decline in what had been a tremendous "classical" investment boom; a rapid fall-off in what had been a tremendous export boom; a flattening out in defense orders (not actually payments, which ran fairly steady), and a resulting inventory reduction.

2. The White House intimates it believes the independent Federal Reserve Board's tight money policies were carried too long, and is now in favor of even easier credit policies, particularly to spur residential home construction. The President points out that the business downturn began last summer, but the FRB didn't loosen credit until October, and that present credit policies may be a "trifle overstern."

3. Inventory replacement may be the kick-off for the business upturn. Between the 3rd and 4th quarter of last year, inventories dropped by $5 billion, and may recover almost as fast. The downswing may be shorter than the conventional down cycle.

4. Reduced capital spending by industry was the result of the downturns in defense orders, export demand, and inventory liquidations, but may also lead the upswing. The present step-up in defense orders wasn't planned for that reason, but it may have the effect of restoring industrial markets and spurring capital investment.

5. New home construction will probably be a bright spot in the upturn, if it is not delayed by undue wage or price increases, the White House says. This would bring a substantial spurt in buying of consumers durables.

New SIC Codes an Aid to Sales

They Classify Industries and Products More Closely

▪ Backing up your market research with the latest statistical data can go a long way in helping your company do a thorough selling job.

To aid industry in its marketing plans, the Bureau of the Budget has issued the 1957 Standard Industrial Classification Codes (SIC), a revision of the 1945 codes.

Closer Grouping—Under the new setup, industries are grouped more closely than before in terms of related products manufactured. The revisions are a big step toward getting a higher uniformity ratio in each industry group.

This means that if an industry group has a uniformity ratio of 90 pct, then 90 pct of its output related to the major products described in the title of the SIC group.

Conversion Made Easy—It also means that many of the old code numbers will not coincide with the new numbers. Consequently, "The IRON AGE Basic Marketing Data," just published, is using the 1957 SIC codes together with a handy 1945 SIC conversion table (see below).

The table makes it easy for metalworking companies whose customers are classified under the old system to change over to the new. The Government began using the 1957 codes on all data collected after Jan. 1, 1958.

How Job Was Done—More than 300 industry representatives worked with Bureau of the Budget personnel on revising the codes. It was a job that took about four years.

The representatives from industry were recruited by a committee headed by P. K. Lawrence of the DuPont Co. General supervisor of the work was Horace Stringfellow of U. S. Steel Corp.

Conversion Table for Easy Changeover to 1957 SIC Codes

Old Code 1945	New Code 1957	1957 Industry Designation
2532 Part	2599	Furniture & Fixtures NEC (Mostly 2599)
2532 Part	38??	Classify By Profession (3811, 3841 etc.)
2541	2542	Metal Partitions, Shelving, Lockers, Store Fixtures
2561	3442	Doors, Sash, Moldings, Trim (For Screens, Weatherstrip)
2562 Part	3442	Doors, Sash, Moldings, Trim (For Metal Awnings)
2562 Part	2591	Venetian Blinds & Shades & Accessories
2563	2591	Venetian Blinds & Shades & Accessories
2591	2599	Furniture & Fixtures NEC
3311	3312	Blast Furnaces, Steel Works & Rolling Mills
3335	3339	Primary Nonferrous Smelting NEC
3359	3356	Roll, Draw, Extrude Nonferrous Except Copper and Aluminum
3392 Part	3315	Steel Wire Drawing
3392 Part	3357	Drawing & Insulating Nonferrous Wire
3393	3317	Steel Pipe & Tubes
3399 Part	3392	Nonferrous Forgings
3399 Part	3316	Cold Finished Sheets, Strip, Bars

Old Code 1945	New Code 1957	1957 Industry Designation
3422	3423	Hand & Edge Tools
3424	3423	Hand & Edge Tools
3431 Part	3431	Enameled Iron & Metal Sanitary Ware
3431 Part	3432	Plumbing Fixture Fittings (Brass Goods)
3432	3433	Heating Equipment Except Electric
3439 Part	3433	Heating Equipment Except Electric
3439 Part	3631	Household Cooking Equipment
3439 Part	3589	Service Industry Machines NEC (For Commercial Cooking & Food Warming Equipment).
3441 Part	3441	Fabricated Structural Steel For Buildings
3441 Part	3449	Architectural & Misc. Metal Work
3462	3461	Automobile Stampings
3463	3461	Metal Stampings
3465	3479	Coating, Engraving, & Allied Services
3466	3479	Coating, Engraving, & Allied Services
3467	3479	Coating, Engraving, & Allied Services
3468	3471	Electroplating & Polishing
3471	3642	Lighting Fixtures

Old Code 1945	New Code 1957	1957 Industry Designation
3481 Part	3315	Steel Wire Drawing & Steel Nails
3481 Part	3399	Nonferrous Nails
3489	3481	Fabricated Wire Products
3494	3452	Bolts, Nuts, Screws, Rivets
3494	3451	Screw Machine Products
3497 Part	3497	Metal Foil Except Aluminum
3497 Part	3352	Metal Foil: Aluminum
3521	3522	Farm Machinery & Farm Tractors
3531 Part	3531	Construction Machinery
3531 Part	3532	Mining Machinery
3532	3533	Oil Field Machinery
3542 Part	3542	Machine Tools, Metal Forming Types
3542 Part	3548	Metalworking Machinery Except Machine Tools
3543 Part	3544	Dies, Jigs, Fixture, Die Sets
3543 Part	3545	Machine Tool Accessories, Cutting Tools, Measuring Devices
3562	3534	Elevators & Escalators
3563 Part	3535	Conveyors
3563 Part	3536	Hoists, Industrial Cranes, Monorail Systems
3565	3537	Industrial Trucks
3568	3433	Heating Equipment, Except Electric
3575	3581	Vending Machines For Merchandise
3581	3633	Household Laundry Equipment
3583	3636	Sewing Machines
3584 Part	3635	Household Vacuum Cleaners
3584 Part	3584	Industrial Vacuum Cleaners
3585 Part	3632	Home Refrigerators & Farm Freezers
3585 Part	3585	Ind. & Com. Refrigeration Machinery, Air Conditioners.
3589 Part	3639	Household Appliances NEC (Dish Washers, Water Heaters, Garbage Units)
3589 Part	3589	Service Industry Machines NEC
3591	3494	Valves & Fittings
3592	3498	Fabricated Pipe, Fittings, Bends, Nipples
3593	3562	Ball & Roller Bearings
3599 Part	3591	Machine Shops, Jobbing
3599 Part	3599	Machinery & Parts, Except Electrical NEC
3611 Part	3643	Current-Carrying Wiring Devices
3611 Part	3644	Noncurrent-Carrying Wiring Devices
3612	3624	Carbon Brushes & Electrodes
3613	3611	Electric Measuring Instruments
3614	3621	Motors & Generators

Old Code 1945	New Code 1957	1957 Industry Designation
3615	3612	Power Transformers
3616 Part	3613	Switchgear & Switchboard Apparatus
3616 Part	3622	Industrial Controls Electric & Electronic
3617	3623	Electric Welding Apparatus & Accessories
3619 Part	3619	Electric Transmission Equipment NEC
3619 Part	3629	Electric Industrial Apparatus NEC
3621 Part	3631	Major Household Cooking Equipment
3621 Part	3634	Minor Household Electric Appliances
3621 Part	3639	Household Appliances NEC. (Dishwashers, Water Heaters, Garbage Units)
3631	3357	Drawing & Insulating Nonferrous Wire
3641	3694	Electric Equipment For Internal Comb. Engines
3651	3641	Electric Lamp Bulbs, Flash Bulbs, Ultra Violet Lamps
3661 Part	3651	Radio & TV Receivers
3661 Part	3662	Radio & TV Transmitting, Signaling & Detection Equip.
3661 Part	3679	Electronic Components NEC
3662 Part	3671	Radio & TV Receiving Tubes Except Cathode Ray
3662 Part	3672	Cathode Ray Picture Tubes TV
3662 Part	3673	Transmitting, Industrial & Special Purpose Tubes
3664	3661	Telephone & Telegraph Apparatus
3669	3662	Radio & TV Transmitting, Signaling & Detection Equip.
3693 Part	3641	Electric Lamp Bulbs, Flash Bulbs, Ultra Violet Lamps
3693 Part	3673	Transmitting, Industrial & Special Purpose Tubes
3693 Part	3693	X-Ray Equipment & X-Ray Tubes
3716	3791	Trailer Coaches
3821 Part	3821	Mech. Measuring & Controlling Instruments, Except 3822
3821 Part	3822	Automatic Temperature Controls for Appliances & Comfort Heating
3932	3931	Musical Instruments & Parts
3933	3931	Musical Instruments & Parts
3939	3931	Musical Instruments & Parts
3971	3079	Misc. Plastic Products
3986		Classified According To Material
3991	3999	Manufacturing Industries (Metal) NEC
3997	3585	Ind. & Com. Refrigeration Machinery
3998 Part	3565	Industrial Patterns
3998 Part	3999	Manufacturing Industries (Metal) NEC For Models

Defense Contractors Look to '59

Excess Capacity Is Still a Problem

In the face of aircraft cutbacks and the still unsettled missile picture, defense contractors are somewhat uncertain.

They hope new business late this year will bring them back into the market for capital equipment.—By K. W. Bennett.

▪ U. S. spending for missiles and aircraft for 1958 will rise 25-30 pct over 1957 levels, Air Force men now believe. Some defense plant order backlogs are already 50 pct over year ago levels and rising.

It is not, however, an immediate bonanza of fast flowing dollars. Not until the end of 1958 will a real spurt in defense buying hit metalworking generally. Here's why Air Force procurement men and veteran defense contractors are talking cautious optimism:

Excess Capacity—Even if production contracts for aircraft and missiles were let immediately, there is a considerable amount of excess defense production capacity to be soaked up.

There are at least 500 companies producing aircraft and missile equipment on a full time, subcontract basis for the big aircraft prime contractors. About 20 of these subcontractors can be classed as major companies. The sweeping cutbacks of the past seven months have put these plants back to 45-60 pct of capacity.

Aircraft Decline—Secondly, the grim spectre of a planned three year decline (1957-1960) in aircraft production still hasn't been wiped out. It's agreed that missile production will hit 35 pct of all aircraft purchases by December 1958. General Orval Cook of the Aircraft Industries Association believes 50 pct of the aircraft order backlog will consist of missile orders at that time.

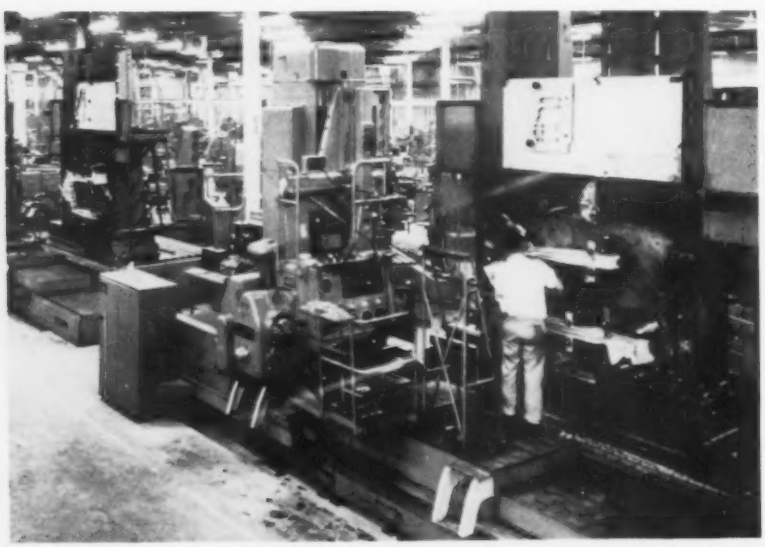
And third, aircraft and missile builders may expand after December 1958, as new production schedules become firm, but until then they have a fair reserve of idle machines and little capital.

Example Cited—H&B American Machine Company is a case in point. One of the biggest of the full-time defense subcontractors in missile and aircraft work, H&B contributes parts to 17 aircraft, is vendor to at least 10 important prime contractors.

Like many full-time subcontractors, H&B has a specialty; high tolerance 3D milling. It works in a variety of metals: Magnesium, titanium, aluminum, 4130 and 4340 steels, as well as special stainless steels. Despite this excellent background, H&B saw its sales drop 45 pct in latter 1957. In this respect, it is typical of the subcontract industry. It will recover ground rapidly through 1958. But it's highly unlikely the firm will need to expand its capacity before 1959.

Tool Customers in 1959—Aircraft and missile men, and the subcontract industry, are eager to work with the new machine tools, particularly 3D equipment and numerical data control equipment. Their comment: "We like the new machine tools, but we'll wait until late this year before we'll be sure buyers. At the moment we're heavy on capacity but not on capital. Admittedly, we do a lot of tool rebuilding, but we think the new machine tools look good. But we'll wait."

Aircraft and missile expenditures could hit $18-$20 billion in 1958—as compared with $12 billion in 1957. But it's not going to create a forward surge in supplier business until the close of the year. From that point on, however, the picture is extremely strong.



SPECIALISTS: Typical of specialization in defense subcontracting work is this concentration of 14 Kellering machines in H & B American Machine Co. This company has several contracts for new aircraft.

Three-time ABC winner, famous bowler BILL LILLARD slams in strike after strike sending ball and pins flying against piece of TI-CO set up in pit. Close up examination by Bill shows plenty of punishment but no flaking. TI-CO's zinc coating rolled with the punch!

BOWLING CHAMP FAILS TO FLAKE INLAND TI-CO®!

Switch to **TI-CO** Non-Flaking Galvanized saves manufacturers up to 15% in Production Costs.

A well-known garage door manufacturer dispensed with plating operations—reduced costs 10%. A leading furnace manufacturer saved $20 per thousand parts produced by eliminating cleaning and painting. A company making roller gravity conveyors cut out similar operations. These are just a few of many case histories of manufacturers who realized important savings and improved their product when they started using TI-CO Galvanized Sheets.

Whenever a product requires the strength of steel, plus corrosion resistance, Inland TI-CO is the most satisfactory . . . the most practical . . . the most economical material to use. That's because TI-CO is produced with a zinc coating that will not flake even under the toughest conditions. The coating stretches with the base metal during fabrication. Deep drawing, brake or roll forming, crimping, stamping, lock-seaming even severe spin-drawing . . . TI-CO takes them all in stride with no flaking or peeling. With TI-CO there's no need for costly dipping or touching up. And the uniform, bright spangled finish adds to the over-all attractiveness of the product.

If you're manufacturing or designing a metal product that requires corrosion resistance, consider TI-CO Galvanized Sheets. Manufactured in coils or cut lengths up to 60" widths, gauges 8 to 30 inclusive. Consult your local steel distributor or Inland sales representative. Write today for a free informative booklet on TI-CO.

INLAND TI-CO®

INLAND STEEL COMPANY

30 W. Monroe Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport St. Louis • Kansas City • Indianapolis • Detroit • New York

Before the Premier of "Steel Valley"

SHARON MOVIE: NBC's Mitchell Stanley talks with James A. Roemer, chairman of Sharon Steel Corp. (center), and A. M. Tredwell, president (right), before the first TV showing of "Steel Valley," a movie about new specialty steels, filmed entirely in Sharon plants.

Defense Dept. Silent On Tool Spending

Military leaders are keeping the machine tool industry in the dark on plans for tool buying in the new fiscal year.

Congress is looking at Defense Dept. spending proposals. Pentagon officials will be going to Capitol Hill to defend their projected outlays. But they are keeping mum about their ideas for ordering defense production tools.

Individually, the services have these answers to questions on tool purchases:

Army—We don't know yet what we're going to buy. Our technical services will submit their separate projects to Dept. of the Army for approval.

Navy — Our budget categories are still too broad to permit machine tool plans to be identified.

Air Force — Individual items aren't now tagged by name in our budget. The department will have to hold off naming any amount for new tools until we give budget testimony to Congress.

Closest identification of proposed tool programs is under the budget heading, "production equipment and facilities." The Defense Dept. wants to spend $368 million under this heading.

Used Tool Tax-am?

Tax equality for buyers of used machinery again is being asked of Congress by President Eisenhower.

The President recommends accelerated depreciation formulas be extended to purchases of used machinery and other used property up to $50,000 in any one year. This privilege has been available to purchasers of new machinery.

Senate Summons Auto Industry Leaders

Labor and management views on the prices manufacturers place on new cars will get detailed study by a Senate group.

In hearings beginning Jan. 28, the antitrust subcommittee, Senate Judiciary Committee, will examine auto industry wage-price policies (The IRON AGE, Dec. 12, p. 109). Chairman Kefauver, D., Tenn., invites Walter Reuther, UAW president, to be the initial witness.

Heads of four auto companies are asked to discuss pricing before the subcommittee. The executives are Harlow Curtice, of General Motors; L. L. Colbert, of Chrysler; Henry Ford II, of Ford; and George Romney, American Motors.

Line of questioning that the management spokesmen will face in some two weeks of hearings is already indicated. The subcommittee will bear down hard on increased prices and alleged lack of competition.

Urges Standard Inch

Dr. A. V. Astin, head of the National Bureau of Standards, is urging the standardization of the inch in the three countries where this is the basic unit of measure.

The NBS director pointed out that while the difference between the U. S., British and Canadian inch is less than a hundred-thousandth of an inch, it is creating a roadblock in critical technological cooperation.

Crash Contract

A $370,000 crash program contract to build Redstone missile check-out equipment has been awarded Designers for Industry, Cleveland, by the Army.

The company will complete necessary development work on these units and furnish detailed drawings and hardware for delivery on March 1, 1958.

Inland Has New Home

Inland Steel Co. has moved into its new headquarters at Dearborn and Monroe Streets, Chicago, just across the street from its old offices.

Company officials and general office staff of 350 are occupying the top eight floors of the 19-story, ultra-modern skyscraper.

STARRETT PRECISION MAKES GOOD PRODUCTS BETTER

Starrett Flat Stock and Die Stock
• Over 1000 sizes, precision ground to Starrett standards of finish and accuracy
• 4 types — air, oil, oil or water and water hardening
• 40 thicknesses from 1/64" to 3"
• Widths from 7/64" to 14"
Starrett
LAYOUT DYE
Starrett

STARRETT precision ground FLAT STOCK and DIE STOCK

fastest way to make small parts . . . costs less

Just lay it out and saw it out . . . that's how Starrett Precision Ground Flat Stock and Die Stock help you handle those many special jobs that tie up valuable men and machines.

Anything with two flat parallel sides can be produced quickly and economically . . . no time lost hunting up stock — no slow and costly grinding to size. Choose the exact width, thickness and hardening characteristics you need.

Your Industrial Supply Distributor offers dependable service on Starrett Precision Ground Die Stock and Flat Stock — each piece marked for type and size and individually packaged in protective envelope. A new, compact, quick look-up chart lists all types and sizes with hardening instructions. Ask him for your copy or write Dept. IA, The L. S. Starrett Company, Athol, Massachusetts, U. S. A.

Starrett

FLAT STOCK and DIE STOCK

World's Greatest Toolmakers

STARRETT TOOLS

PRECISION TOOLS • DIAL INDICATORS • STEEL TAPES • GROUND FLAT STOCK • HACKSAWS • HOLE SAWS • BAND SAWS • BAND KNIVES

BRIDGEPORT BRASS
COPPER ALLOY BULLETIN

Bridgeport Reporting New Developments in Copper-Brass Alloys and Metalworking Methods

Duronze #707 Has Many Applications

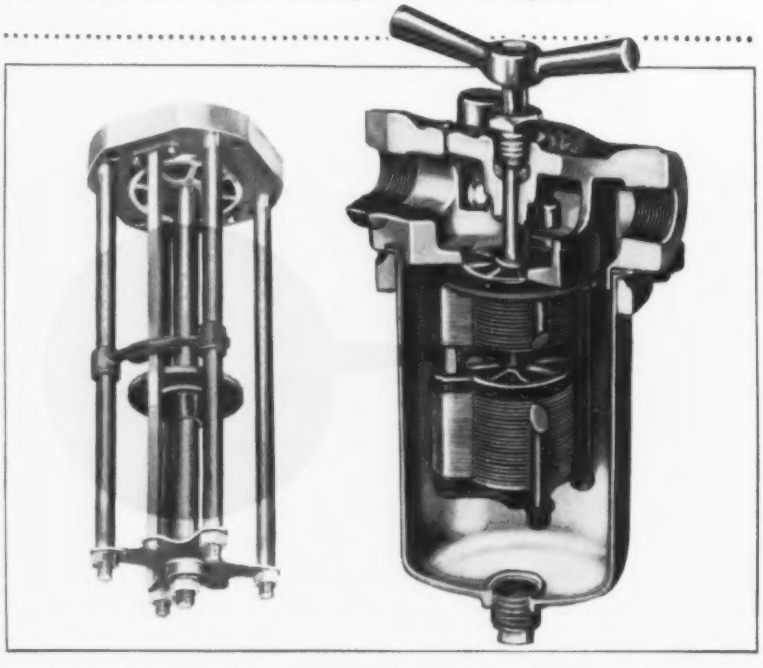
by M. A. BUELL
Chief Staff Metallurgist

Duronze #707 is a truly versatile aluminum-silicon bronze alloy. Its combination of properties—good machinability, corrosion and wear resistance, high tensile strength, low coefficient of friction, and excellent fatigue resistance—is ideally suited to many product requirements.

It can be used advantageously, for instance, as components for solderless wire cable connectors and pole line hardware; for nuts, bolts and studs; and for compression fittings on oil and gas lines in aircraft. Since Duronze supporting sleeves in compression fittings distribute vibration and fatigue stresses over a greater area of the tube than is possible with ordinary fittings, serious breaks in the tube lines can be prevented.

Still another important property offered by Duronze #707 is its high tensile and yield strength in its annealed condition. This makes it especially suitable for hot working into gears, pinions, valve parts, rollers, etc. The friction between Duronze #707 and steel is less than that between steel and steel. It can thus be used to replace steel or cast-bronze parts and generally give longer life. Duronze #707 hot-forgings include suspension clamps and terminals for hollow cable jumper and strain connectors; valves; parts for oxyacetylene torches; and marine hardware.

Duronze #707 is just one of five different aluminum and silicon bronze alloys made by Bridgeport. Each has outstanding combinations of mechanical and physical properties designed to meet specific engineering needs. For more information and test samples call your nearest Bridgeport Sales Office.



Unique Continuous-Flow Filter Uses Duronze Backbone For Strength and Corrosion Resistance

The unusual design of the Auto-Klean® Filter manufactured by Cuno Engineering Corporation, Meriden, Conn., permits it to be cleaned continuously, either manually or by motor, without costly interruption of flows or service.

Filtration is obtained by passing the fluid between wheel-shaped metal discs placed edgewise to the flow. These discs are separated by spacers of predetermined thickness so that solids larger than the spacers cannot pass through. Extending into the slots between the discs are the knifelike cleaner blades. Filtration down to 1 micron is possible.

Duronze #707 Backbone

The mounting of the filter disc and cleaner-blade assembly is vital to efficient operation. To help insure accurate alignment, Cuno relies extensively on Bridgeport Duronze #707 (Aluminum-Silicon Bronze Alloy) to form the main spindles which are the backbone of the assembly. Strong, corrosion resistant and easily machined, Duronze #707 has all the qualities needed for the rigid requirements of this application.

Duronze #707 for Engineering Jobs

Duronze #707 is one of a number of engineering alloys made by Bridgeport to meet the needs of durable, hard-working products. Its high strength and corrosion resistance, plus good machinability are important advantages from both production and economy standpoints. It will pay you to see how Duronze can meet your requirements. Your Bridgeport Salesman, backed by Bridgeport Technical Service, will be glad to help you. Call him today.

®Reg. trade name of Cuno Engineering Corp.

Bridgeport **BRIDGEPORT BRASS**

Bridgeport Brass Company, Bridgeport 2, Connecticut • Offices in Principal Cities
In Canada: Noranda Copper and Brass Limited, Montreal

William F. Crawford

An Old Hand at Riding Out Dips

Even in the best times, the valvemaking industry is highly competitive.

Here is how one executive helped to pull his company through the worst dip of all.

▪ The lessons on operating a business that William Fowle Crawford learned during the depression years of the 1930's still hold good today.

Mr. Crawford, who is president of Edward Valves, Inc., East Chicago, Ind., says the big factor which helped his company weather the depression storm was research and development. His company now ranks 10th in the valvemaking industry.

Doubling R&D—"Self examination for the purpose of survival . . . was a business must," he recalls. "Most concerns that managed to stay alive emerged from the period sadder but wiser.

"Experience can be a cruel teacher, but now I look upon those years and the critical management problems they created with the knowledge that at least they taught me first-hand business lessons I'll never forget."

That he hasn't forgotten is apparent. Edward Valves devotes more than one-tenth of its total plant space to research and development. This portion is currently being nearly doubled. The company claims one of the best metallurgical laboratories in the steel valve industry.

Father-Son Team — Crawford, now 47, went to work for Edward Valves when he was 15. He became president at the age of 31, upon the death of his father, William W. The elder Crawford was a management expert brought into the company in 1923. His job was to liquidate ailing Edward Valves or nurse it back to health.

WILLIAM F. CRAWFORD: Taking time off from making valves.

Some measure of what the two Crawfords did is illustrated by the fact that their firm competed successfully against the leaders in producing powerplant and gas and petroleum industry valves.

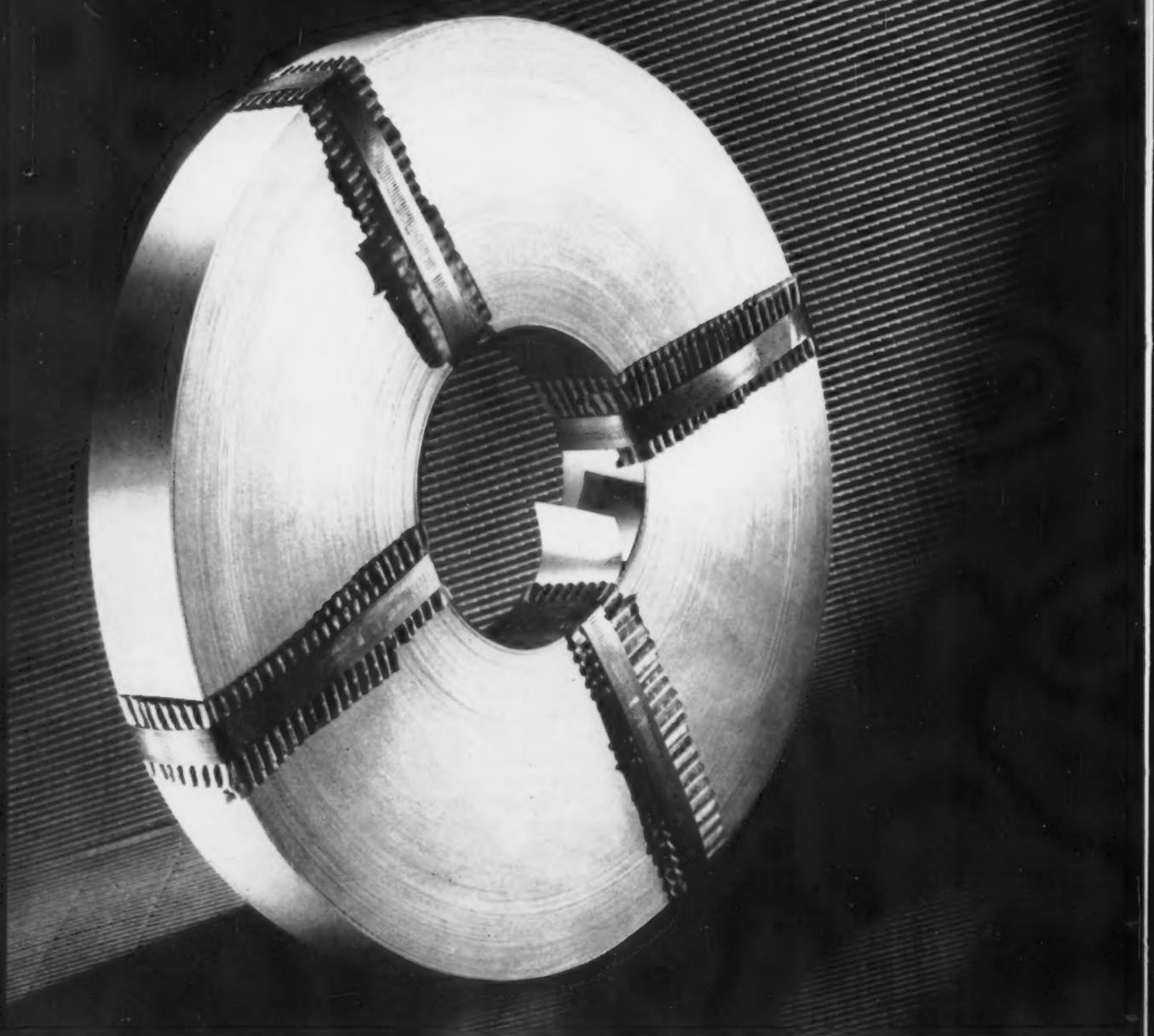
Keeps on the Go—"We aren't in the same size and class with the largest valve makers, so to compete for sales in their league we have to offer a superior product," he explains. "On the surface, at least, valves are not complicated. Though the differences in efficiency between them can be considerable."

A native Chicagoan, Crawford is a man-in-motion type executive. He has visited every important valve plant in Europe and South America to study valvemaking methods and develop new markets. Export accounts for about 15 pct of Edward Valves' sales total.

Part - Time Cowhand — As a man-in motion, his activities run the gamut from membership in the South Shore Community Association, and the Chicago Art Institute to the directorship of seven corporations, two banks, and the Circle Z Ranch in Patagonia, Ariz., where he takes an occasional crack at cowpunching (see photo).

J&L

RESTRICTED SPECIFICATION COLD ROLLED STRIP STEEL



J&L THE 4 IN 1 SOURCE

Four plants with facilities in Youngstown, Indianapolis, Los Angeles and Kenilworth, N. J., for the production of restricted specification cold rolled strip steel. J&L Strip Steel Division Products: Low Carbon, High Carbon, Annealed or Hardened and Tempered Spring Steel, Electro Galvanized or Hot Dipped Continuous Galvanized, Tin Coated, Alloy, Stainless.

Jones & Laughlin
STEEL CORPORATION
STRIP STEEL DIVISION
GENERAL OFFICES: YOUNGSTOWN 1, OHIO
PLANTS: YOUNGSTOWN • INDIANAPOLIS • LOS ANGELES • KENILWORTH, NEW JERSEY
SALES OFFICES: NEW YORK • ROCHESTER • NEWINGTON, CONN. • YOUNGSTOWN • CLEVELAND
DETROIT • INDIANAPOLIS • CHICAGO • LOS ANGELES • SAN FRANCISCO
FORMERLY THE COLD METAL PRODUCTS COMPANY

Behind the UAW's New Demands

Profit sharing isn't the kind of an issue the UAW is likely to strike for now.

Reuther's new scheme is something that can be traded off for economic demands. The short week will wait for a more advantageous time.

▪ The new profit-sharing plan of the United Auto Workers focuses attention on the possibility of an auto strike next summer.

Actually, the latest of Walter Reuther's news-making demands can't be put in the same class, as a strike issue, as the supplemental unemployment benefits plan.

Short Week Postponed—But if you read the straight economic demands (see p. 52) you will find out what the autoworkers really want. And it's plenty.

What happened to the short work week? It was just postponed. The UAW leaders decided, and probably wisely from their point of view, that this was not the time to go all out for it.

If the UAW had stuck by the short work week, it probably would have been stuck with it. With the auto business in the state it is, none of the automakers would have given in. The UAW would have had to take a long strike, with the possibility of a humiliating defeat.

Trading Material — So the new demands were developed. But the "supplementary economic demands" are not the kind that the UAW is likely to strike for. Instead, they will probably be used as trading material.

When the UAW does decide to go for the short work week, it won't pick a disadvantageous bargaining time. Until that time, schemes like profit-sharing make good points to bargain away for cash and fringe benefits. And the possibility of a long auto strike is now diminished.

New Budget Has Its Problems

Later Than You Think—Don't get any inflated ideas of what the fat, new defense budget is going to do for metalworking. There will be an effect, of course, but it may come later than you think.

First indications of a business upturn, expected in the second half of this year, will have to come from the conventional sources of consumer spending, home construction, replacement of inventories and the like. Government spending on highways and other projects will also help.

New Rules—This does not mean that defense is no longer a major factor in the economy. But the old rules of thumb don't apply in a defense budget where the money will go for missiles and its related industries.

Writing in the Harvard Business Review, Eliot Janeway points out that one of the major significances of the changing defense picture is the lengthening of lead time in a cycle when business is dominated by aeronautics.

Time Factor — You may not agree with Mr. Janeway that aeronautics and its related industries have taken over as the dominant factor in the economy. But the significance of the time factor in a missile program can't be missed.

Remember, as pointed out in a recent evaluation of the missile program (The IRON AGE, Jan. 6), contracts for all announced missile programs were let at least five years ago. Some aren't even in production yet, others are just getting started, and others have been phased out as obsolete after tremendous expenditures of money.

Mr. Janeway points out that in an automotive dominated economy, the cycle had shortened to a year. Manned aircraft, like new jet bombers, lengthened to seven years, and the missiles cycle will be longer.

Not All Cheerful—In fact, some of the facts of a multi-billion-dollar missile program have some unpleasant implications. For example:

The missile program will contribute to inflationary factors while doing little to ease unemployment by creating new jobs.

It will aggravate manpower shortages that are already critical—engineers, highly skilled workers, and technicians.

There will be no lengthy production runs of any given missile. Theory is to build up any given missile to a saturation point, then replace it with a newer version.

All this will be accompanied by cuts in other areas of the budget that have been sources of pump priming.

AUTOMOTIVE

UAW Drops Profit-Sharing Bomb

Management Takes Violent Issue With New Proposal

There are hectic days ahead for negotiators at the automotive bargaining table.

Reuther must also justify dropping demands for a 30-hour week.—By H. R. Neal.

▪ Automobile manufacturers and the auto workers' union get along like cats and dogs in a barrel. Recently the commotion in the barrel had died down. It was just a lull before the storm.

At a press conference in Detroit last week, UAW president Walter P. Reuther lifted the lid, pulled the old cat out, and ceremoniously dumped a fresh cat into the barrel. Moments later Mr. Reuther had his commotion back in motion.

Endorsement Certain—The old cat was the demand for a shorter work-week. Mr. Reuther's new cat has more lives—each as stormy as the old one. This week the union's special convention meeting in Detroit is getting a close-up look at the new animal. Before the convention ends some 3000 UAW local representatives will pass judgment on what they see.

There are some—besides the automobile manufacturers — who don't like it. But in all likelihood Mr. Reuther's new concept will win the acclaim of a majority of the assembled delegates. It will then emerge as the Union's demands for 1958.

Minimum Demands—Simply, the union demands a substantial general wage increase coupled with improvements in SUB and pensions; and a share of auto company profits.

Specifically, the first category (see box below) represents "a minimum basic economic demand which will be common for all employers." The union declined to put a price on it. Its elements are familiar and thus not unexpected.

Most of these demands shouldn't meet more than a normal amount of bargain-table resistance from the automobile manufacturers. It will just be a question of threshing out "how much" in dollars and cents, as in past years.

The New Cat—But it is the second category of demands that has created the stir. The union calls it "a set of supplementary economic demands." It is profit sharing—for everybody, or nearly so. Under the plan management, workers and consumers would share in the bulk of a firm's profit.

All profits above 10 pct before taxes would be split three ways: 50 pct for the company, stockholders and executives; 25 pct for hourly and salaried employees other than current bonus plan executives; and 25 pct to consumers as a rebate on any of the companies' products bought during the year.

Workers Share—The union statement said the formula proposed was based on one used by General Motors and Ford for computing executives' bonuses. If the union's profit sharing plan had been in effect at GM during 1947-1956, Mr. Reuther said, it would have meant an average yearly bonus of $600 for some 500,000 GM employees.

Mr. Reuther described the demands as non-inflationary. By tying wage increases to improved productivity and dividing profits at the end of the year, he claimed, inflationary wage pressures often criticized by management officials would be obviated. At the same time, he said, profits should be

And in Addition to Profit-Sharing—

▪ Here are the "minimum basic economic demands" which autoworkers unions will make at bargaining sessions this year:

1) An immediate general wage increase of at least 10-12¢ an hour, based on increased productivity.

2) Correction of wage inequities in production, skilled trades, and other classifications.

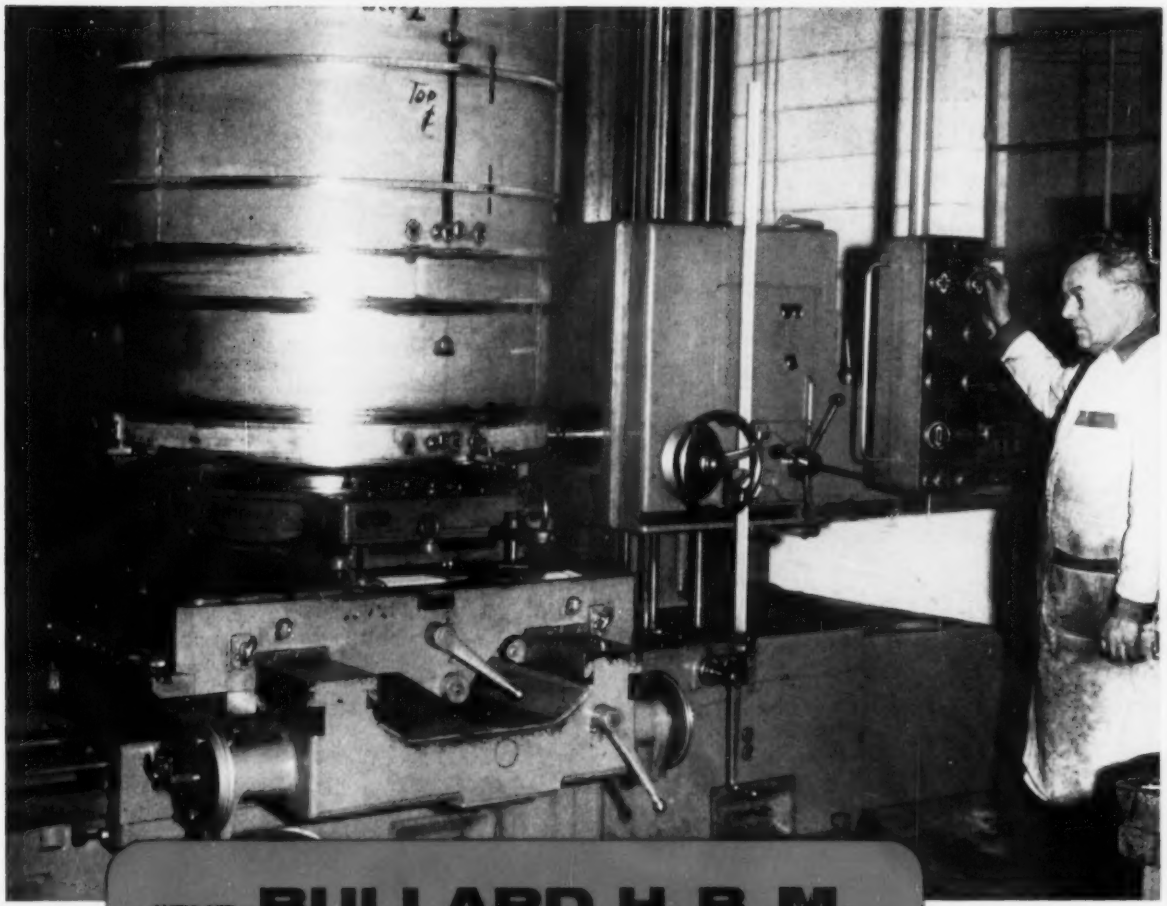
3) Increased SUB payments and extension of the payment period to 52 weeks.

4) SUB payments for workers on short work-week.

5) Improved pension benefits including a cost-of-living adjustment provision and more liberal eligibility requirements.

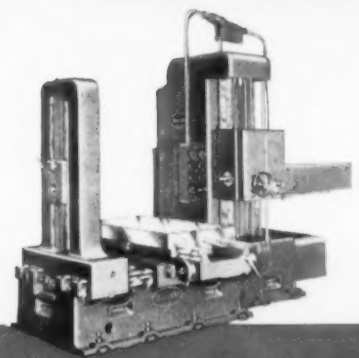
6) Protection of workers affected by decentralization and plant movement through transfers, moving allowances, and severance pay.

7) Improved hospital-medical insurance programs.



"THE BULLARD H. B. M. MODEL 75 is the best on the market": . .

"And yet it costs no more than others. Our accuracy is much improved . . . and production has increased 20%—and business is up by at least 20% . . . these factors mean higher profits. The Bullard H. B. M., Model 75 will pay for itself many times over."



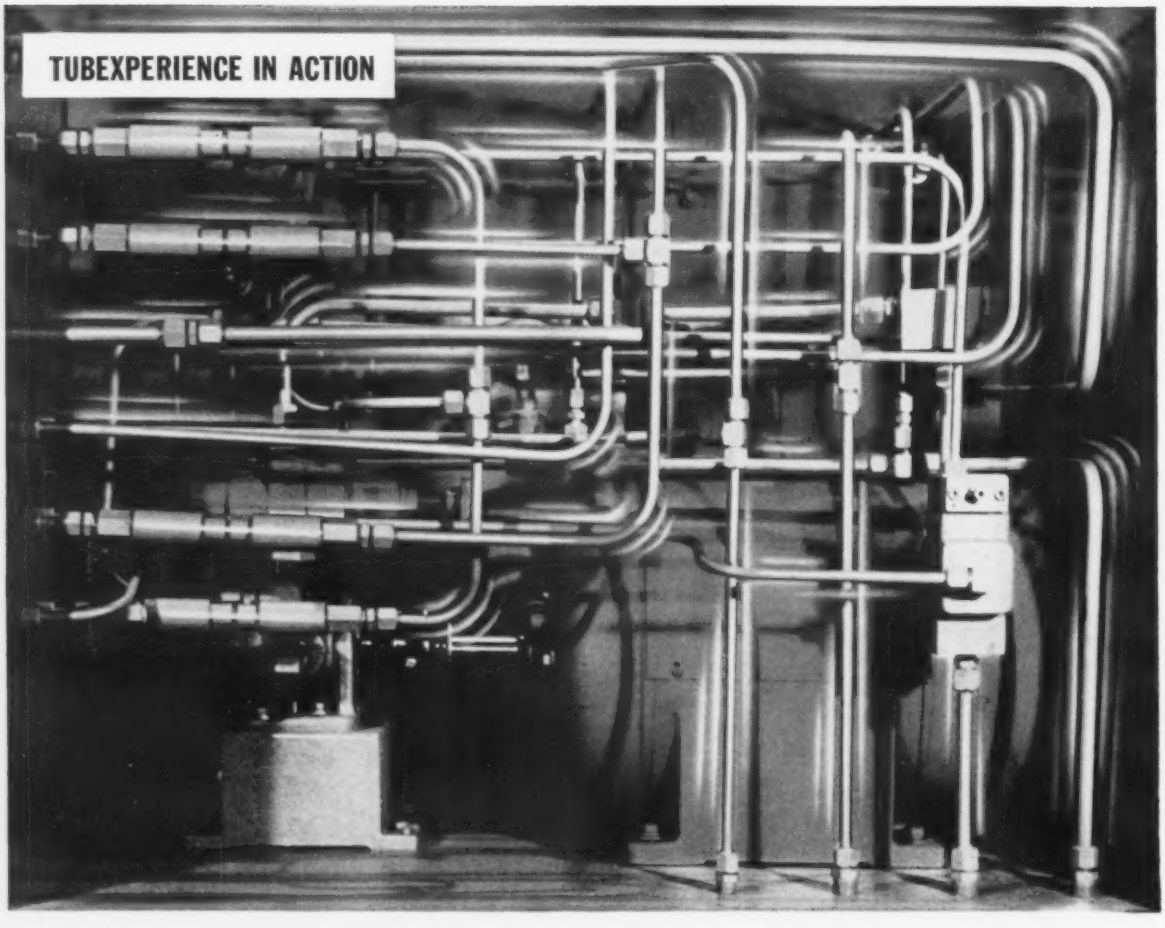
Bullard 3" Horizontal Boring, Milling & Drilling Machine, Model 75 one of four models in the complete line.

This statement by the owner of a leading job shop in the Detroit area is typical of the benefits derived when modern Bullard Machine Tools are applied to machining methods and problems.

How about you? If you're not employing the advantages of modern Bullard Machine Tools, your nearest sales engineer will be glad to review their application to your needs.

to cut costs when cutting metal . . . buy BULLARD

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT



VIBRATION can murder hydraulic lines

Only tubing with high ductility and smooth, uniform surfaces can take this terrific punishment in its stride!

When big motors start delivering power, hydraulic lines go into their vibrating dance. Unless the lines are made from highly ductile material and have exceptionally smooth, uniform surfaces, the ceaseless, pounding vibration may actually cause cracks and ruptures.

Superior hydraulic tubing is available through leading warehouse distributors from coast to coast. Contact the one nearest you today for information—or get a free copy of Bulletin 39 by writing to Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

HERE'S WHY SUPERIOR (SAE) HYDRAULIC TUBING WILL GIVE YOU LONGER, MORE ECONOMICAL SERVICE

High ductility! *Furnished in dead-soft annealed temper, Superior hydraulic tubing flares easily, bends without pinching, can be readily fabricated for any hydraulic application.*

Non-aging steel! *All Superior hydraulic tubing is made of selected non-aging steel. It keeps its ductility, will not become brittle with age. Carbon content is limited to .12% maximum.*

Bright, smooth, clean! *Special processing gives Superior hydraulic tubing an unusually bright, smooth, clean finish on both OD and ID; reduces turbulence and pressure drop. Shipped with special rust preventive coating on both inside and outside surfaces.*

Fully tested! *And not mere random sample testing! Every length of Superior (SAE) hydraulic tubing is 100% hydrostatically tested at maximum working pressure—giving you realistic performance insurance.*

Superior Tube

The big name in small tubing

NORRISTOWN, PA.

All analyses .010 in. to ⅝ in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Co., 5710 Smithway St., Los Angeles 22, Calif. • RAymond 3-1331

Automotive Production

WEEK ENDING	CARS	TRUCKS
Jan. 18, 1958	110,546	19,076
Jan. 11, 1958	120,140	17,928
Jan. 19, 1957	145,761	22,151
Jan. 12, 1957	147,129	20,322
TO DATE 1958	278,298	44,813
TO DATE 1957	384,106	52,405

*Preliminary Source: Ward's Reports

shared with consumers as well as employees and stockholders.

Organizing Pitch—He agreed his union couldn't bargain for anything more than the part pertaining to workers covered by UAW contracts. The consumers' rebate is a proposal to provide "that the consumer would realize his equity on a basis equal to the worker."

By including non-union salaried employees, Mr. Reuther is also making an organizing sales pitch. It has been pointed out in recent years that the percentage of non-productive workers in industry has been growing while productive employment has decreased. This fact hasn't escaped the attention of union officials.

Management Reacts — The UAW's proposal didn't escape the attention of officials of the automobile companies, either. In the past, they have preferred to negotiate contracts in the privacy of conference rooms. In recent months they have replied to Mr. Reuther's numerous proposals in the open. This time replies came at near record speed.

General Motors President Harlow H. Curtice was the first to reply. He declared the proposal was "in keeping with the union's earlier threat to exert its tremendous economic power to force upon the auto industry the biggest wage increase in the history of the union."

He denounced the scheme as "foreign to the concept of the American free enterprise system."

Called Inflationary—Ernest R. Breech, Ford board chairman, called the supplementary demands "a complicated kill-the-profits plan" and termed it unrealistic. "We are hopeful that Mr. Reuther will eventually abandon his determination to twist and manipulate the American private enterprise system into something more to his liking than it now evidently is."

Chrysler President L. L. Colbert disagreed the proposal was non-inflationary. He charged Mr. Reuther with attempting "to fight inflation by making a whole series of new inflationary demands upon the auto industry."

Independents Would Suffer—American Motors President George Romney blasted the proposals as a "subterfuge" devised to silence criticism of pattern bargaining. "I an convinced that a formula based on wresting concessions from an entire industry on the basis of concessions determined by the most profitable company must be stopped if we are to have a competitive and growing economy."

But the automobile companies are not the only ones who have voiced disapproval over the UAW's proposed 1958 battleground. Mr. Reuther will face strong opposition from within.

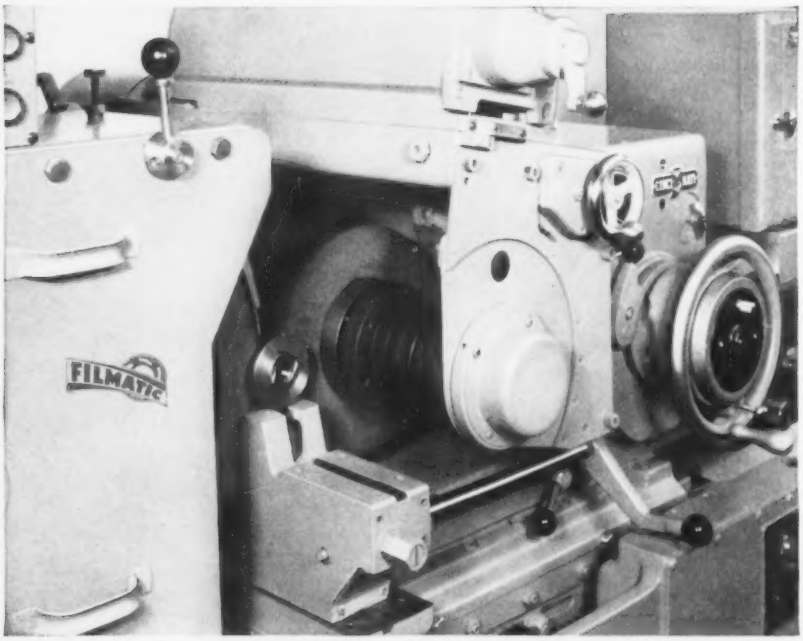
Internal Dissension—Union resistance is being lead by Carl Stellato, president of Ford Local 600, largest union local in the world. Mr. Reuther had explained the reason for deferring the four-day workweek. "The launching of the Sputniks has revealed and dramatized the true dimensions of the challenge of communist tyranny and has emphasized the necessity for us to make the fullest possible use of our human and material resources to meet that challenge."

Mr. Stellato it also anti-communist. He is also anti-Reuther. In addition, he has been the leading advocate of a shorter work-week as a means to save jobs. Mr. Reuther, he feels, has just sold him down the river in the guise of patriotism. "You can bet there will be plenty of opposition to the idea on the floor of the convention—and I'll be right there," he said.

"The 1957 convention mandated that the demand for the shorter work-week be the No. 1 demand."

THE BULL OF THE WOODS

I SUPPOSE THAT'S FUNNY, GOIN' AROUND KICKIN' PEOPLE! I HOPE HE CRACKS THAT GUY'S CROCK AGIN TH' MACHINE-- IT'LL LEARN HIM A LESSON AN' MAKE HIM THINK TWICE BEFORE HE DOES IT AGAIN!
YEH? WELL, YOU'RE JUST AS BAD--YOU NEED A LESSON IN THINKIN' TWICE! WHY HOPE HE CRACKS ANOTHER GUY'S CRANIUM T'LEARN A LESSON? WHY NOT HOPE HE BUSTS HIS OWN FOOT AN' LEARNS A LESSON?
PEOPLE'RE THAT WAY, THOUGH--THEY SAY OF A RECKLESS DRIVER,'OH, HE'LL HIT SOMEBODY SOME DAY AN' IT'LL LEARN 'IM A LESSON'--HALF TH' WORLD IS LEARNIN' AN' TH' REST ARE TRYIN' T'KEEP FROM BEIN' LESSONS!
THE RECKLESS DRIVER
© 1958 by NEA Service, Inc. T.M. Reg. U.S. Pat. Off.



Several automatic features incorporated in this CINCINNATI FILMATIC No. 2 Centerless Grinder reduce nonproductive time in centerless grinding two diameters on turbine shafts.

Nonproductive Chores are Automatic

. . . on this Cincinnati Centerless

Give the operator an assist with nonproductive chores and he'll accomplish more. One way to do it is to *automate* as many nonproductive elements as possible in the cost of machining. Cincinnati grinding specialists proceeded along these lines in equipping a CINCINNATI® FILMATIC No. 2 Centerless to grind two diameters on turbine shafts. Automatic features for reducing nonproductive time include:

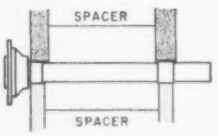
Automatic profile truing for grinding wheel, including cycle counter

Automatic grinding wheel balancing

Automatic grinding wheel reciprocating, with truing interlock

Automatic Electro-Hydraulic Infeed

These cost-reducing features are in addition to well-known Cincinnati advantages such as bed rock mounting of grinding wheel spindle; FILMATIC grinding wheel spindle bearings; double slide support for the regulating wheel unit. Cincinnati is unquestionably the best buy for your precision centerless grinding work. Get additional details by asking for catalog No. G-644-3, or look in Sweet's Machine Tool File for brief specifications.



Drawing of part showing diameters ground.

Production Data:

Part name	Turbine shaft
Material	Steel
Stock removal	.010"
Production	150 parts per hour

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO

CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES • ROLL GRINDING MACHINES • SURFACE GRINDING MACHINES • CHUCKING GRINDERS MICRO-CENTRIC GRINDING MACHINES • CENTERLESS LAPPING MACHINES

Brass Fights Reorganization

It Won't Be Easy to Streamline Military

Pentagon leaders will fight any move to take away their prerogatives of rank.

They may be fighting a losing battle. Change may be inevitable to meet new defense problems.—By G. H. Baker.

▪ The Defense Department hierarchy is making it clear that it won't agree to any reorganization plan that involves fewer jobs or less authority.

Thus, President Eisenhower's call for an end to quarreling among top Army-Navy-Air Force brasshats is doomed to failure—unless Ike and the Congress crack down on the constant bickering and jostling that has marred top-level defense planning since the so-called military unification law was enacted more than 10 years ago.

Change Is Inevitable—Root of the wrangling is, of course, the natural reluctance of the hierarchy to give up any of the perquisites to which the military leaders have been accustomed. But in this era of missile warfare, the old lines of delineation between the jobs performed by the Army, Navy, and Air Force tend to fade out.

Wrangling over missile authority goes on constantly between the Army and the Air Force. Army, clamoring for control and direction of the missile program, claims missiles are a logical extension of long-range artillery, whereas the Air Force says missiles are simply pilotless aircraft and therefore subject to Air Force control.

Oppose One-Man Rule—Politically speaking, the Congress is not disposed to "buy" the current proposal for a single, powerful chief of staff to replace the present joint chiefs of staff. This plan smacks too much of one-man military rule to be entirely acceptable to the Congress. But somewhere short of one-man rule in the Pentagon, there is a crying need for a pruning of the sprawling Pentagon establishment that more each year tends to look more like three separate—and competing—Departments of Defense and less like the complementary—and noncompeting — Departments of the Army, Navy, and Air Force intended by the Congress.

OPPOSED TO CHANGE: Adm. Arleigh Burke, Navy Chief of Staff, says concentration of Pentagon power could "lay the foundation of disaster." The Admiral is outspoken in defending the chiefs of staff system.

Can Ike Bring Reform?—Reform is frankly long overdue. But whether or not President Eisenhower is able to bring about an end to the sniping between the generals and the admirals remains to be seen. Chances are he won't unless Congress writes some tough new laws to pare down the top-heavy chairborne hierarchy.

This will be one of the key issues before the current Congress.

Seller's Guide to the Farwest

Variety of New Firms Represented

While bloom is off the boom there's no shortage of new plants in West.

Here's list of the latest setting up shop in southern and northern California. — By R. R. Kay.

▪ Although business is off, more people and plants keep coming West to stake a claim. And metalworking grows and grows.

Last year almost every Farwestern state landed important new metalworking plants. The bulk of them still goes to California.

Here are some of the latest. They point up the variety of products and services Californians still need.

Southern California — National Steel & Shipbuilding Corp., San Diego $1.5 million expansion of shipbuilding facilities. Frame-A-Door Corp., Los Angeles—metal door frames. Sheffield Western Corp., Glendale—machine tools, gages.

Admiral Aluminum Awnings, Glendora—aluminum awnings for trailers. Burgmaster Corp., Small Tool Div. of Burg Tool Mfg. Co., Inc., Gardena—bench model drilling and tapping turret drill. Strongcraft Products, Inc., Los Angeles—wire baskets, bottle carriers, display racks. Marquardt Aircraft Co., Saugus—ramjet engines.

Automotive, Missile Parts—California Metal Enameling Co., Los Angeles—porcelain enamel sign materials. Northridge Dynamics, Northridge—machine shop. Southwestern Engineering Co., Los Angeles—vibrating screen separators for process industries.

Auto Parts Exchange Co., Puente — automobile parts. Research Tool & Die Works, Gardena. Behlman Engineering Co., Burbank—electronic equipment. Simonds Abrasive Co., El Monte—abrasive products.

Richardson Camera Co., Inc., Burbank—film projectors, viewers, cameras. Challenge Manufacturing Co., Los Angeles—transit mix concrete mixers. Pacific Durable Products, South Gate—machine shop.

Amelco, Inc., Los Angeles — guided missile parts. United Testing Laboratories, Monterey Park—mechanical and environmental testing. Royal Inner-Spring Co., Los Angeles. The Johnal Co., Northridge — machine tools

Northern California — Hi-Vac Mfrs., Oakland — vacuum pumps. General Electric Co., San Leandro —industrial controls for high voltage motors. Stuart Oxygen Div. of Liquid Carbonic Corp.—$2.5 million liquid oxygen manufacturing plant.

Harbison - Walker Refractories Co., Warm Springs—basic refractories. Apex Bronze Foundry Co., Oakland. Quality Tool & Die Mfg. Co., San Leandro—tool and die manufacturers.

Titan Metal Manufacturing Co., Newark — brass mill. McGrath Steel Co., Emeryville—fabricators.

Production Line Portrait of the Snark

READIED FOR SERVICE: The USAF-Northrop Snark—a 5000 mile intercontinental guided missile under construction at Hawthorne, Calif.—will go on operational duty with the Air Force Strategic Air Command.

JONES & LAMSON
MACHINE COMPANY

the man who needs
a new machine tool is
already paying for it

. . . And so goes the profit

Consistent accuracy can be a costly thing. Particularly when it doesn't exist. And when it doesn't exist, productive labor in the U. S. A., the highest priced commodity of its kind in the world, is being mis-used.

When setting net sales prices which will give a fair profit and still remain competitive, it is an absolute necessity to stay within your manufacturing cost estimates. And you know in which direction they go when hampered by scrap, and production down-time.

So — don't be fooled by existing equipment that seems to be still useful. Take a closer look and see if it is still *profitable.*

Our brochure on Machine Tool Replacement analysis is yours for the asking. Write to Jones & Lamson Machine Company, 511 Clinton Street, Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Precision Boring Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

Kit Makes Designing Job Easier

You Can Work Out Your Own Machine Models

A Scandinavian inventor had fellow inventors in mind when he devised his kit.

Parts may be assembled and disassembled until results are obtained.—By E. J. Egan, Jr.

▪ Sketching an idea for a new machine or mechanism is easy. But converting the sketch into a full-size product can be a long and costly business. And when you're finished, there's always a chance the thing won't work as well as you expected it to.

A Swedish inventor named Mark Sylwan thought he saw a way for inventors and machine designers to save time and money in checking out their brain children. In 1952, he brought out a universal machine-construction kit (sort of a super Erector set).

U. S. Introduction—But the kit was much more than a toy. It was loaded with precision-made parts: rods, beams, ball bearings, gears of all kinds, racks, ratchets, sprockets, pulleys, springs, universal joints and other components. Sylwan said it could be used to make precision working models of practically any type of machine, drive or mechanism.

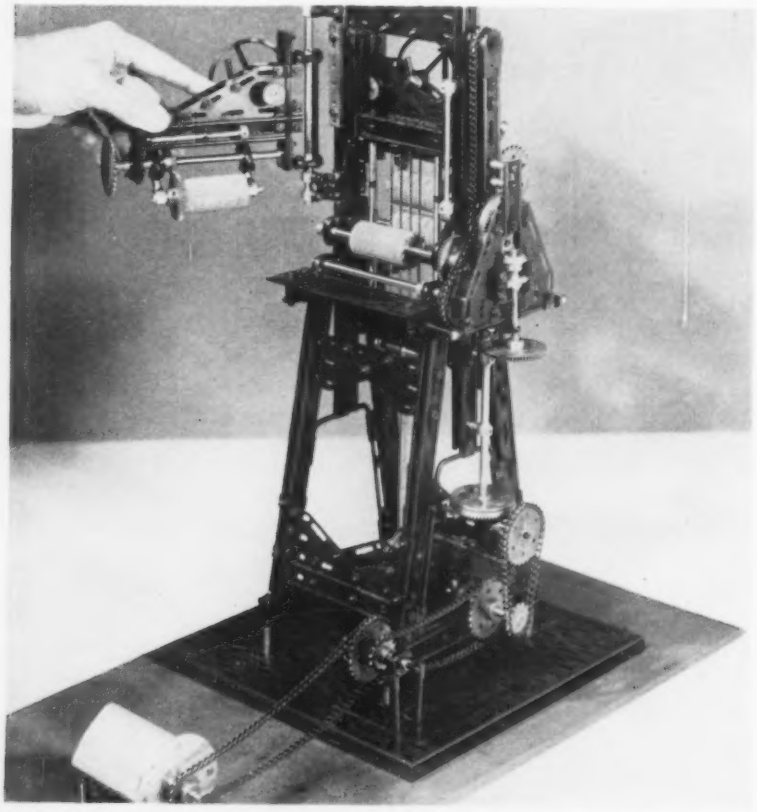
Apparently the kits were received enthusiastically on the continent. And now, improved versions of the original FAC Universal Machine-Construction System kits are available in this country from FAC Div., Overseas Commodex Corp., Detroit.

Starting the Model — Sylwan's system uses beams and rods as basic construction units. These pieces can be assembled into rugged structural frameworks. Mechanisms made up of the various kit components can then be mounted on or within the required frameworks.

Proves Out Designs—For example, FAC kits have been used to build models of such things as: huge log saws, traveling cranes, articulated railway cars, and rotary printing presses. In each case the models were set up to prove designs before final blueprints were drawn and full-scale construction started.

Nor are the kits limited to model-making. One firm used the parts to build a ball-point pen tester which gets hard use every day. Or, it's possible to build many small machines and devices for research work, for teaching student engineers, to use as sales tools.

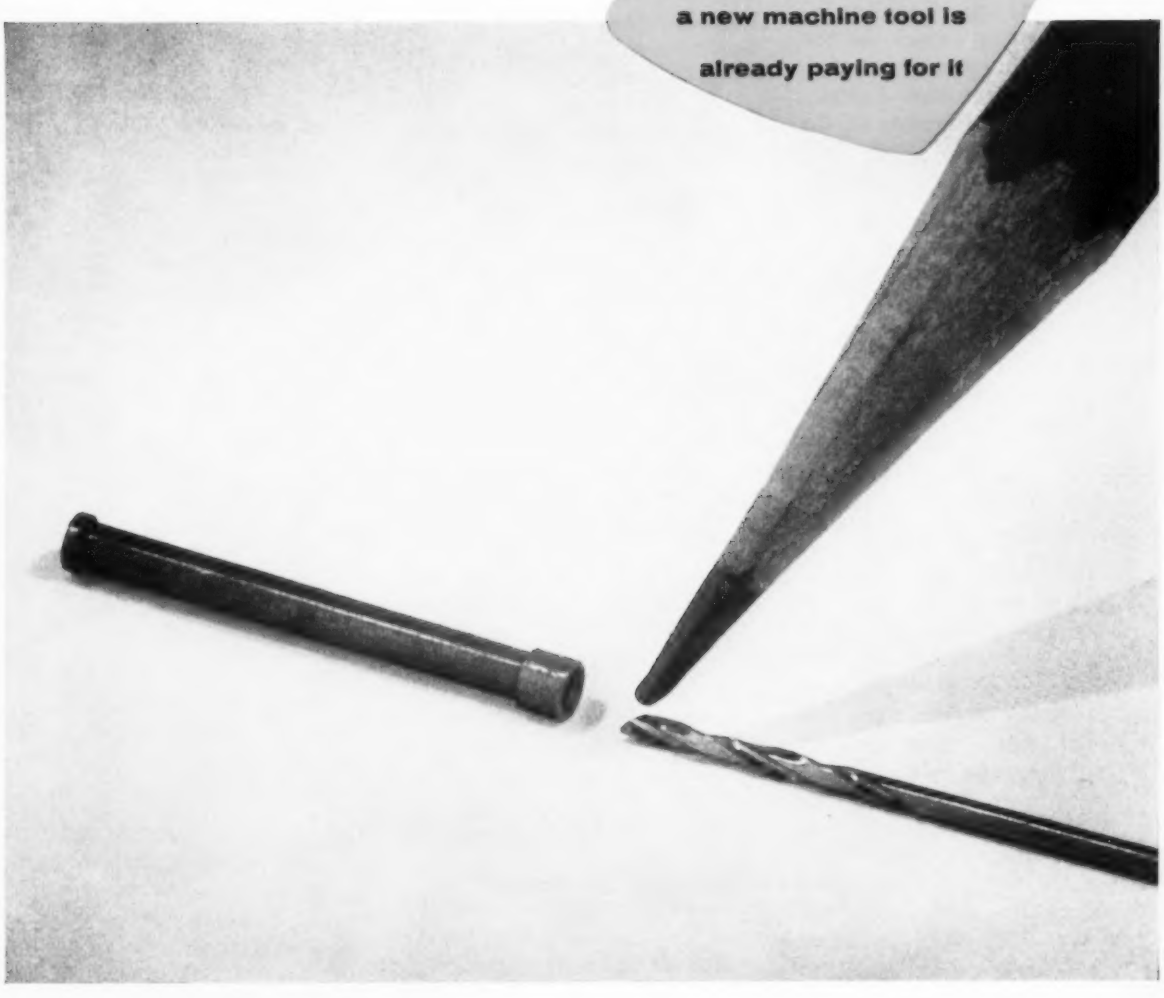
Large and Small—There are two kit sizes, each with its own manual of basic instructions. The smaller unit has 2700 individual pieces; there are 4700 parts in the larger one, which is slanted especially toward industrial machine design and development needs.



TIME AND MONEY SAVER: Working model of a gang log saw was built from standard parts supplied in FAC universal machine construction kits.

JONES & LAMSON
OPTICAL COMPARATORS

the man who needs
a new machine tool is
already paying for it



How sharp is your figuring pencil?

This was a fascinating production problem! The customer for these little tubes is the world's fussiest and most exacting — Uncle Sam. And the production run was close to two million. There's a stepped hole running the length of these little pieces — that is, in the accepted ones. But the *drills* weren't fussy. Three-quarters of the time, they'd go right out through the sides of the work pieces. Needless to say, drill breakage was high.

Staging the drills on a J & L Comparator revealed that some drills had curvatures. The magnified shadow of this tiny drill filled the thirty inch glass screen. The pencil is shown here, first: to dramatize the scale, and secondly; to suggest that you sharpen your pencil to find out just what inspection errors are costing you. Want to see optical comparators at work? Ask for a showing of "Beyond the Shadow of a Doubt", our 16mm, color, sound film. Jones & Lamson Machine Co., 511 Clinton Street, Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Precision Boring Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

INDUSTRIAL BRIEFS

More Heats—Precision Founders Inc. has purchased the Mars Mfg. Co. of San Francisco. The acquisition was made to increase wax injection diemaking capacity at the new San Leandro plant. Mario DeGennaro, former owner of Mars, has accepted the position of die shop manager.

Caustic Competition — The Industrial Chemicals Div. of Olin Mathieson Chemical Corp. has opened a storage and distribution terminal at Bedford Park, Ill. The terminal will make Olin Mathieson competitive in delivery service on liquid caustic soda in the Chicago area. Shipments from the terminal to tank car and tank truck users will be made at the current delivered cost from established competitive producing points.

Austrian Accent—Pencoyd Steel Forge Corp., Philadelphia, has completed arrangements to act as sole representatives in the U. S. for forgings for Bohler Brothers & Co., Ltd. of Vienna, Austria. Pencoyd's particular interest is in the nonmagnetic ring forgings which it makes especially for the retaining of the coils on the rotors of electrical generators. The Bohler process enables them to produce rings of extreme toughness and of extraordinary uniformity.

"And another thing . . . when J. B. calls you—get in there fast!"

Du Pont on the Campus—Grants totaling nearly $1.1 million have been awarded to 135 universities and colleges in Du Pont's annual program of aid to education. The total for the next academic year is about $100,000 more than Du Pont contributed for this school year. Grants for fundamental research are being continued, as are grants for fellowships, which once made up the entire plan. Du Pont's program dates from 1918.

Service Center — Reading Tube Corp. has opened a sales office and 12,000-sq ft distribution depot in leased quarters at 921 Penn St., Philadelphia. The facility services a marketing area extending from the southern boundary of New York State to the southern boundary of Virginia. It brings to ten the number of such depots operated from coast to coast by the manufacturer of copper and brass tubing.

Link-Belt to L. A.—Link-Belt Co. opened its new Los Angeles plant on Jan. 16 with an openhouse celebration. The plant is located at 1200 Sycamore St., Montebello, and more than doubles the manufacturing capacity of the company's former Los Angeles plant. Link-Belt has been represented in Los Angeles since 1913.

Switch Controls — Controls Co. of America has entered into a contract for the acquisition of Hetherington, Inc. The latter is a manufacturer of precision electrical switches. Acquisition will be through an exchange of 65,000 shares of Controls Co. common stock for all the outstanding shares of Hetherington. Hetherington will be operated as a wholly-owned subsidiary without change of its present management.

Full Cycle—Allied Chemical & Dye Corp, has begun production at the new sulfuric acid plant of its General Chemical Div. in Elizabeth, N. J. The plant will serve customers in North Jersey, New York and New England, supplying them by rail, truck and barge shipments. Facilities are available for decomposition and regeneration of by-product spent acids which will help solve troublesome disposal problems for many industries using sulfuric.

Bentonite for Taconite—A new plant to supply bentonite for Minnesota's taconite industry is being built by Archer-Daniels-Midland Co. at Colony, Wyoming. The Minneapolis company has 25,000 acres of open pit bentonite mining property in Wyoming. Colony is about 20 miles northwest of Belle Fourche, South Dakota. The plant will be a push-button installation with the entire processing operation controlled from a central control room. Completion is scheduled for early February.

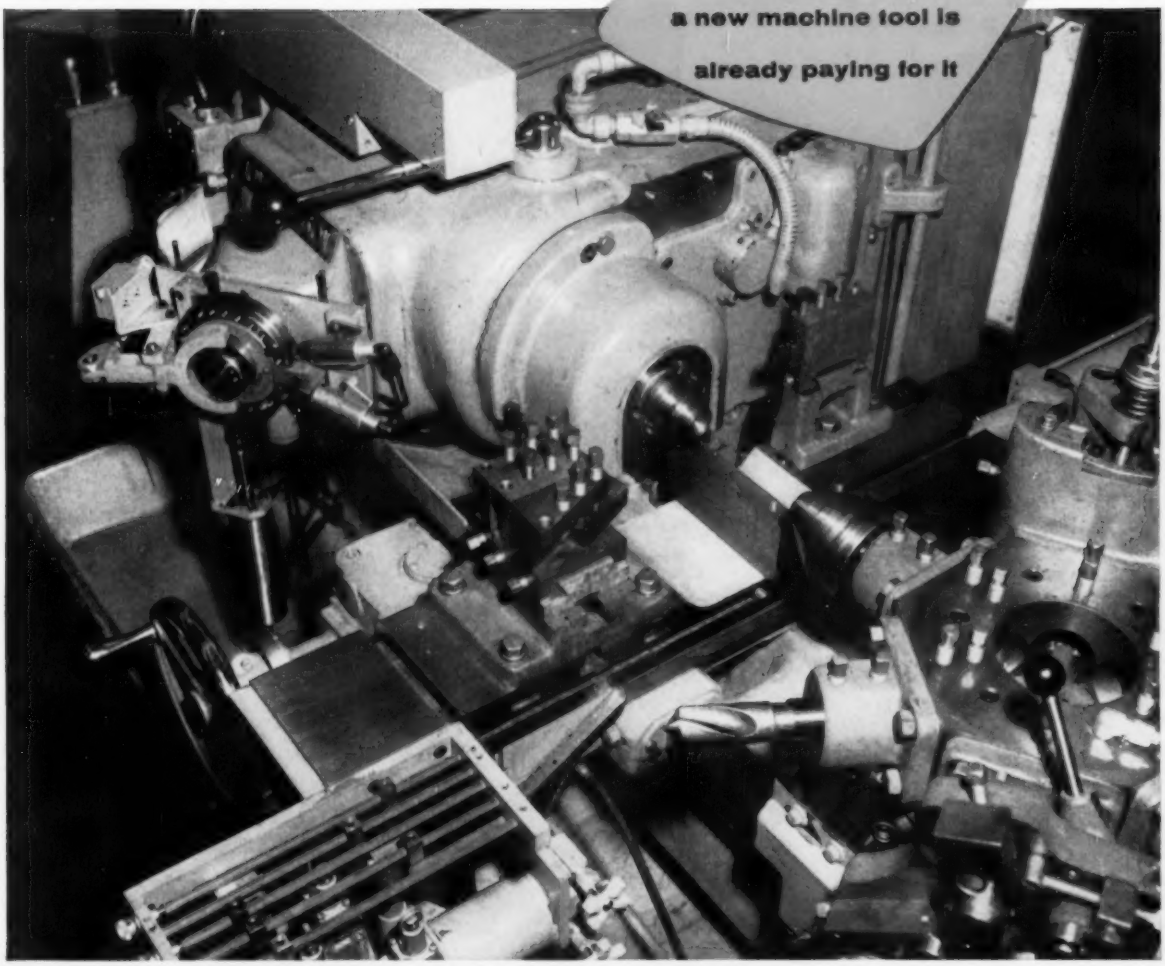
Going into Space — Elgin National Watch Co.'s Micronics Div. will move to a $1 million plant on Sept. 1. The 60,000-sq ft headquarters and combination development-production plant will be located in the northwest suburban area of Chicago. The division specializes in development and custom production of high precision components, chiefly involving guided missiles, automatic aircraft control systems and timing instruments.

International Relations — Formsprag Co. is expanding its program in export sales. Within the past month, the Warren, Mich., clutch manufacturing concern has entered into distributorship agreements with 45 companies in 29 countries of Europe, Asia, Africa, Oceania, and Latin America to sell its products abroad. An additional 50 distributors in non-Iron Curtain countries will be signed up during the next 30 days.

Stoking Up—Shenango Furnace Co., Pittsburgh, has purchased the Lucerne Coke Co. at Indiana, Pa., from the Rochester and Pittsburgh Coal Co. President W. P. Snyder III of Shenango Furnace Co., who also will head the newly acquired firm as its president, said Lucerne Coke will be operated in the future as a wholly-owned subsidiary.

JONES & LAMSON
"AUTOMATION"

the man who needs
a new machine tool is
already paying for it



Where's the Operator?

And for that matter, where's the speed selector? The answer is that they're both absent, because this is a *completely automatic* production operation. It's a custom installation of a Lynn Hydraulic Drive on a Jones & Lamson ram type turret lathe.

This assembly provides fully automatic cycling for both long and short runs. The turret drive provides for rapid approach to the work, variable feeds, controlled dwell, reverse feed, and rapid return of the turret. The cross slide has automatic cross travel in both directions. Feed ranges for the cross slide drive are equivalent to those of the turret drive.

Spindle speed selection, start, stop and reverse are all automatic. Operation of collet chucks and bar feed is also automatic for a continuous repetitive cycle.

Two typical set-ups increased production 26% per machine. One operator handled both machines with ease. Investigate how you can get similar results. Write for literature — Jones & Lamson Machine Company, 511 Clinton Street, Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Precision Boring Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

J. F. Eversole, appointed vice president, Union Carbide Development Co., Div. of Union Carbide Corp.; **F. H. Roberts,** appointed vice president, research, Bakelite Co.

R. J. Blanton and **R. A. Varel,** appointed vice presidents, Varel Mfg. Co., Dallas.

J. W. Murphy, named product manager, stainless steel sheets, Allegheny Ludlum Steel Corp.

J. F. Wilson, elected vice president, sales, Metals & Controls Corp., Attleboro, Mass.

R. H. Winters, appointed executive vice president, sales, National Can Corp.

R. A. Gentles, appointed New York sales manager, Aluminium Ltd. Sales, Inc., New York.

R. D. Mercer, named product manager, stainless steel strip, Allegheny Ludlum Steel Corp.

C. L. Foster, appointed vice president, international sales, The Austin Co., Cleveland.

Howard Hightower, appointed vice president, sales, Hurst Tool & Mfg. Co., Princeton, Ind.

T. J. Koenig, appointed asst. general superintendent, Homestead District Works, U. S. Steel Corp.

R. E. Bremer, elected executive vice president, The Ohio Injector Co., Wadsworth, O.

H. R. Moorhouse, elected executive vice president, Arthur G. McKee & Co., Cleveland; **C. H. Ganzenmueller,** elected secretary.

P. W. Wyckoff, named vice president, engineering, Airtemp Div., Chrysler Corp., Dayton, O.

H. W. Stephens, appointed vice president and treasurer, Berry Steel Corp., Kenilworth, N. J.

R. B. Leland, appointed vice president, sales, Highway Products, Inc., Kent, O.

R. W. Olmstead, appointed executive vice president, H. K. Ferguson Co., Cleveland; **J. R. Fraser,** appointed vice president, engineering; **W. E. Hark,** appointed vice president, construction.

H. L. Burton, Jr., appointed vice president and general manager, Baron Steel Co., Toledo, O.

G. C. Oehmler, appointed asst. to director, sales, stainless and specialty steels, Allegheny Ludlum Steel Corp.

R. T. Hood, elected treasurer and controller, The Gabriel Co., Cleveland.

W. C. Ridge, elected vice president, production, John A. Roebling's Sons Corp.

E. P. Dunlaevy, elected executive vice president, Phelps Dodge Copper Products Corp.; **S. A. Jacobs,** elected president, Inca Mfg. Div., Fort Wayne, Ind.; **J. J. Conlon, W. K. Dunbar, Jr.** and **E. A.**

JONES & LAMSON
MACHINE TOOLS

the man who needs
a new machine tool is
already paying for it

Out-of-this-World Accuracy

Whether they're destined to go "out of this world" or not, many jobs demand some "out of this world" machining. Here's one, on a J & L lathe which is adapted for two-way tracing from the hexagon turret. Critical dimensions on both internal and external tapers, plus several intricate contours are finish-machined in one chucking.

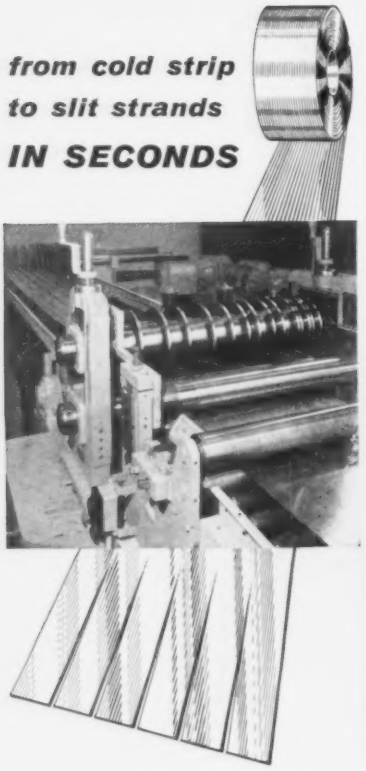
A three-way indexing template holder is push-button controlled. Thus, down-time for template changes is eliminated, and the 180° tracer continues to machine on both the forward and return feed of the saddle carriage.

A single selector switch disengages the tracing unit and the machine is ready for normal* turret lathe operations.

*("Normal" for J & L turret lathes means unsurpassed accuracy, high production, and low, low maintenance.) For details, write for our descriptive folder No. 5440. Jones & Lamson Machine Company, 511 Clinton St., Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Precision Boring Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

from cold strip
to slit strands
IN SECONDS



YODER ROTARY MULTIPLE SLITTERS

A Yoder slitter converts mill-width coils of flat-rolled metal into many variable-width strands in amazingly short time. Speed, coupled with great accuracy and low manpower requirements, makes a Yoder slitter an important factor in keeping production and overhead costs down.

Operated by only two men, the Yoder Type 3-48 slitter illustrated is designed to accommodate standard mill-width coils up to 48 inches wide, in a variety of metals and thicknesses. The slit strand widths can be held to within a .004" tolerance.

Even if your steel requirements are as little as 100 tons a month, the savings to be realized in time, manpower and raw material costs alone will pay for a Yoder slitter in the first few months of operation.

There is a Yoder slitter designed and engineered to meet your requirements, and to speed the delivery of "special" width stock in a wide range of large or small sizes. Send for your free copy of the fully-illustrated, 76-page booklet, "Multiple Rotary Slitting Lines."

THE YODER COMPANY
5510 Walworth Avenue • Cleveland 2, Ohio

ENGINEERING YODER MANUFACTURING
ROTARY SLITTING LINES

Mitchell, named vice presidents; **C. F. Moody,** named works manager, Habirshaw Cable and Wire Div., Yonkers, N. Y.; **L. F. Buckman,** named works manager, Bayway Div., Elizabeth, N. J.

H. B. Block, elected executive vice president, Merritt-Chapman & Scott Corp., New York; **Louis Goldberg,** elected vice president, procurement.

R. M. McCafferty, appointed asst. superintendent, continuous buttweld tube mills, Indiana Harbor Works, The Youngstown Sheet & Tube Co.

H. A. Correa, elected vice president, foreign operations, ACF Industries, Inc.

R. A. Chorpenning, promoted to superintendent, Marine Ways, Jones & Laughlin Steel Corp., Pittsburgh.

R. H. Stebbins, named asst. general sales manager, Gisholt Machine Co., Madison, Wis.

J. S. Doczy, appointed manager, sales, Pittsburgh district, Coal Chemical Sales Div., U. S. Steel Corp.

R. H. Bruce, appointed general sales manager, Gisholt Machine Co., Madison, Wis.

S. M. MacDonald, appointed Detroit sales manager, Transamerican Freight Lines, Inc.

Donald Preckwinkle, named general foreman, Alloy Tube Div., The Carpenter Steel Co., Union, N. J.

E. E. Brayshaw, appointed division superintendent, rolling mills, Keystone Steel & Wire Co., Peoria, Ill.

C. B. Rex, elected treasurer, U. S. Industries, Inc.; **A. P. Moran,** elected controller.

R. W. Ford, named sales manager, Machine Tool Div., Ex-Cell-O Corp., Detroit; **H. A. Knack,** named sales manager, Continental

"...AND WEIRKOTE® CAN DO AWAY WITH PLATING OR DIPPING AFTER FABRICATION! IT WON'T PEEL OR FLAKE."

Q. A zinc-coated steel that won't peel or flake? That could save us a lot of money every month. Just what makes this Weirkote so special?

A. It's made by the continuous process, you know, which integrates zinc and steel so that the toughest fabrication won't break down the bond. You can work Weirkote to the very limits of the steel itself.

Q. Of course, that means the most complicated parts would have protection against rust. I like what I'm hearing. Is there more?

A. Yes . . . now Weirkote is treated to inhibit wet storage stain (white oxide). To make a long story short, I'd say this: With Weirkote, you can turn out a better product at lower cost. And you can free a lot of the capital, floor space and time you have tied up in plating operations.

Send for free booklet that details the time- and cost-saving advantages of skin-tight zinc-coated Weirkote. Weirton Steel Company, Dept. A-7, Weirton, West Virginia.

WEIRTON STEEL COMPANY

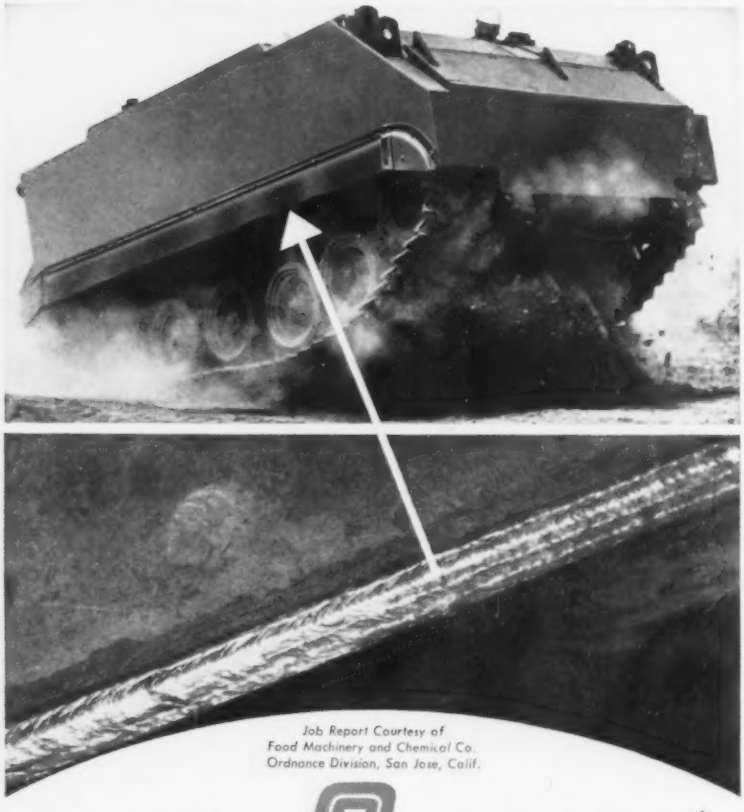
WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

How to produce low alloy welds to resist tons of torture



Job Report Courtesy of
Food Machinery and Chemical Co.
Ordnance Division, San Jose, Calif.

WELD WITH ARCOS

LOW ALLOY ELECTRODES

This 22½ ton armored personnel carrier proves an important point. When working with hard-to-weld low-alloy plate, and welds must be extra strong and tough in the "as welded" condition, it pays to use the highest quality weld metal available. In this case, Arcos Tensilend 100, a low hydrogen coated electrode produced weld metal that matched the physical and chemical properties of the base metal. In addition, it did the job with less nickel than the 19-9 modified electrode formerly used. There was no preheat, no postheat . . . and complete freedom from cracking. ARCOS CORPORATION, 1500 S. 50th St., Philadelphia 43, Pa.

Tool Works Div.; **R. M. LaPierre,** appointed manager, bushing sales.

G. E. Stalle, named general manager, Building Products Div., American Welding & Mfg. Co., Niles and Warren, O.

O. E. Teichmann, appointed associate director, engineering, Borg-Warner Corp.'s center, Des Plaines, Ill.; **C. S. Wiggins,** appointed manager, Washington office.

F. L. Winslow, named controller, Armco Drainage & Metal Products, Inc., Middletown, O.

L. F. Rosing, named superintendent, heat treat and bar finish depts., Canton, O., Republic Steel Corp.

D. A. Batchelder, appointed manager, finance, General Electric Co.'s Gas Turbine Dept., Schenectady, N. Y.

D. W. Gunther, named manager, Semiconductor Dept., Youngwood, Pa., manufacturing plant, Westing-

house Electric Corp.

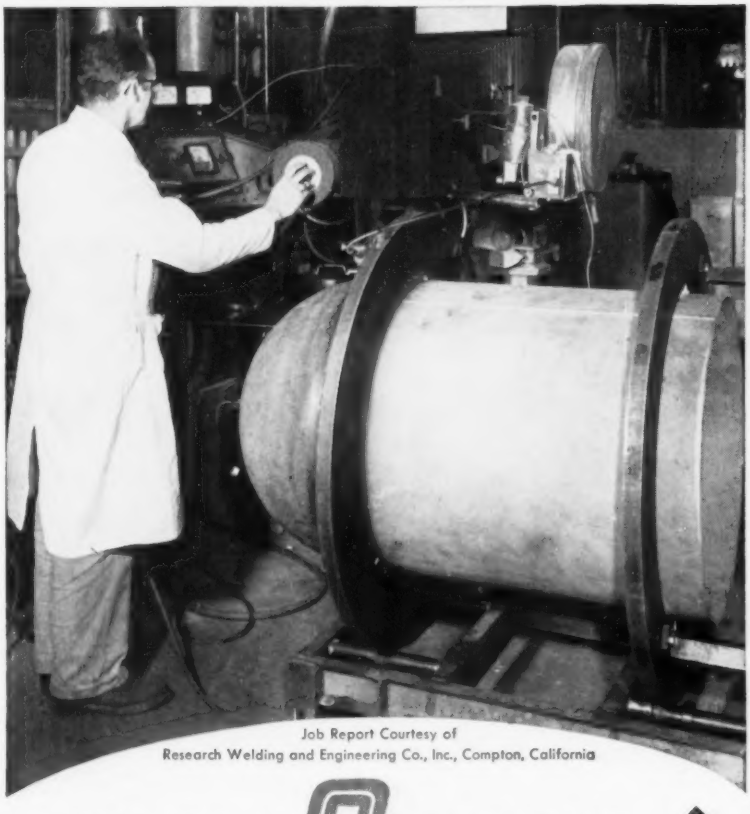
H. E. Berg, named chief engineer, South Chicago steel plant, Republic Steel Corp.

W. E. Banner, appointed superintendent, 45 and 80 inch mills, Fairless Works, U. S. Steel Corp.

T. D. Clifford, appointed superintendent, rolling div., Fairless Works, U. S. Steel Corp.

W. F. Courter, named asst. manager, distribution, Aluminum Co.

Weld from one side only . . .
Get X-ray quality welds



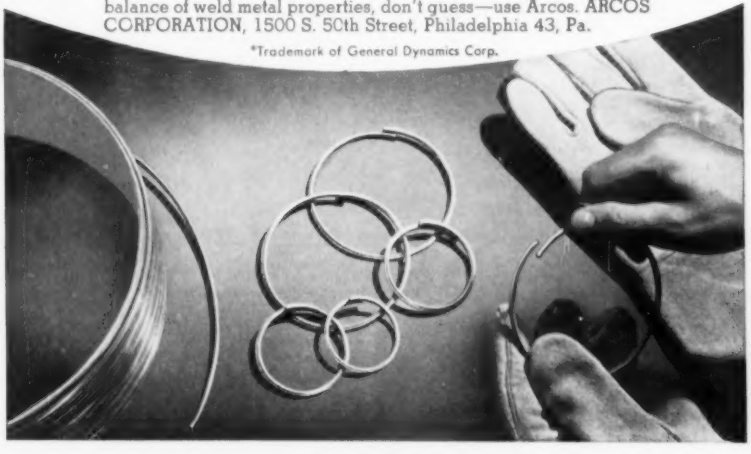
Job Report Courtesy of
Research Welding and Engineering Co., Inc., Compton, California

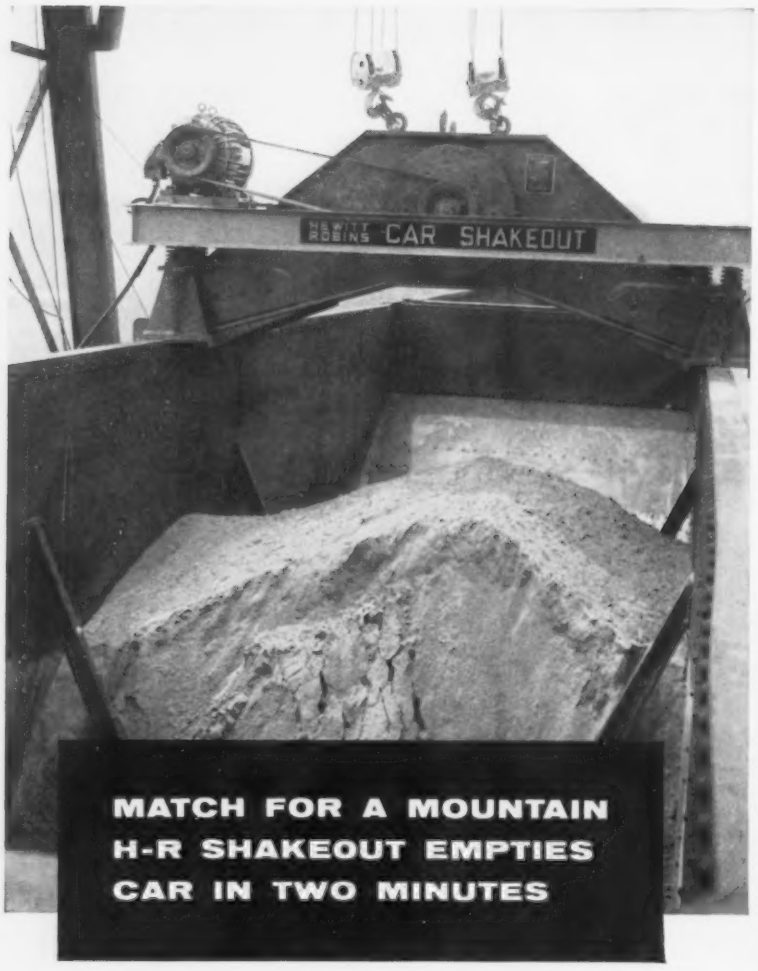
USE THE ARCOS

EB* WELD INSERT

This welded missile tank had to weigh less than 600 pounds and yet contain air under pressure of 3,000 p.s.i. Arcos EB* Consumable Weld Inserts were used in automatic inert gas arc welding of the dished heads to the tank body. The inserts saved weight by eliminating back-up rings. They also allowed welding to be done conveniently from one side only and produced 100% x-ray quality root passes. Chromenar CMV coiled wire for submerged arc welding was used to complete the welds. After heat treatment the welds matched the base metal, with tensile strength in excess of 200,000 pounds p.s.i. Whenever your job requires a proper balance of weld metal properties, don't guess—use Arcos. ARCOS CORPORATION, 1500 S. 50th Street, Philadelphia 43, Pa.

*Trademark of General Dynamics Corp.





Just one Hewitt-Robins Car Shakeout mounted on an "A" frame, and emptying 90 cars per day, unloaded an actual mountain, 250,000 cubic yards of fill, at the site of a new railroad freight station in New Rochelle, N. Y. This Hewitt-Robins Car Shakeout, installed by the Gilbane Building Company, delivers 1,460 vibrating strokes per minute to empty a car in two minutes—a job which would require three men working an hour to do manually.

1,500 of these rugged Shakeouts are proved time, labor and money savers with coal, petroleum coke, limestone, ore, dirt fill, and many other materials. Even partially frozen cars have been safely unloaded without car damage at a fraction of the previous time required. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.

HR HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS . . . POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

of America, Pittsburgh; **J. S. Harrison,** named general manager, personnel.

J. H. Hansen, named asst. superintendent, 45 and 80 inch mills, Fairless Works, U. S. Steel Corp.

J. V. McGuire, appointed asst. general manager, Pittsburgh Works, Allis-Chalmers Mfg. Co., Milwaukee.

OBITUARIES

C. D. Clawson, 55, president, Ferro Corp., Cleveland.

G. H. Case, 78, vice president, Williams-White & Co., Moline, Ill.; **J. E. Maynard,** 78, manager, Chicago office.

P. J. Castora, 59, vice president, Pittsburgh Engineering & Machine Co., Glassport, Pa.

W. C. Christianson, 50, general sales manager, Trent Tube Co.

F. B. Foster, 79, founder and former president, Frank B. Foster, Inc., Pittsburgh.

QUALITY TUBE from Brainard starts with SHARONSTEEL

From mine to finished product, Brainard Welded Steel Tubing has that extra quality that comes only from integrated industry. Brainard Welded Steel Tubing has this extra advantage. Quality controlled from blast furnace to your receiving dock, Brainard can match your most exacting specifications.

For complete information on Brainard's Welded Steel Tubing, send for this all new catalog.

Brainard Steel Tubing
Griswold St. Ext., Warren, Ohio

Name: _____

Address: _____

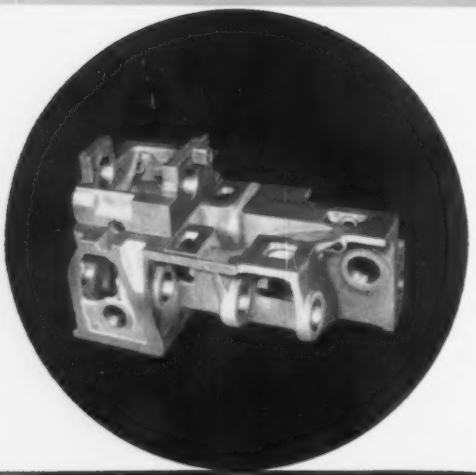
City: _____ Zone: ____ State: _____

Brainard Steel Tubing

SHARONSTEEL

622

Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio



At Brown & Sharpe

Natcos Help From

At Brown & Sharpe, a 22-spindle Natco 3-way Machine handles finished drilling, boring and reaming on "00" screw machine beds

NATCO

Slash In-Process Time 16 Weeks to One Week

On Automatic Screw Machine Beds

Even on precise machine tool parts, traditionally handled on a "job-shop" basis, Brown & Sharpe gained great advantage by installing an automatic line. Prominent in the line are two Natcos, engineered and tooled to handle all drilling, boring and reaming on either the No. 00 or No. 2 automatic screw machine beds.

One Natco does all roughing—the second handles finishing. Total of 62 operations. Each Natco is tooled to process two parts at once—tooling is interchangeable to accommodate either sized bed.

Extreme machine tool accuracy must be maintained throughout. In one operation the Natco drills through five walls, holding centers parallel to the locating surface within .0015″ for the full 42″ distance. In another case, Natco engineering devised a tooling leaf that automatically drops through a core in the part, providing internal boring bar support.

Natcos make sense even on "job-shop" jobs. Call in a Natco Field Engineer—he can quickly tell you whether a Natco can be a cost-saver on your next job.

National Automatic Tool Company, Inc.

Richmond, Indiana ***Multi-spindle drilling, boring, and tapping machines. Special machines for automatic production.***

Call Natco Offices in Chicago, Detroit, New York, Buffalo, Boston, Philadelphia, Cleveland, Los Angeles; distributors in other cities.

Why cars don't mind having the shakes

An occasional health club shake-up makes people feel better. But everyday road vibration can make cars grow old too soon.

Tinnerman SPEED NUTS are helping prevent this, on cars as well as appliances, toys, and all types of assemblies.

Here's how we make certain that SPEED NUTS will hold tight even under severest vibration. Special vibration equipment in our lab shakes SPEED NUT-fastened assemblies strenuously in three directions, cycling from only a few strokes to 3600 cycles per minute. Every SPEED NUT designed must undergo this test . . . and every one must pass before it's approved.

This is another reason why you can rely on any Tinnerman SPEED NUT Brand Fastener to give your assemblies greatest fastening security.

Write for "A Story of Quality", which describes the complete Tinnerman research facility. Address:

TINNERMAN PRODUCTS, INC.
P.O. Box 6688 • Dept. 12 • Cleveland 1, Ohio

TINNERMAN

Speed Nuts®

FASTEST THING IN FASTENINGS®

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S.A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano-Bundy GmbH, Heidelberg.

PART 1

What We Need in High Temperature Materials

By A. J. Carah—Asst. Missiles Design Engineer, Douglas Aircraft Co., Inc., Santa Monica, Calif.

Ten years ago, we had all the metals and methods to make any kind of conventional airplane.

It's a different story today. We're short on high temperature materials and low cost techniques for building space-age planes and missiles.

Here's a summation of our present position and the developments that are urgently needed.

▪ How serious are the high-temperature problems involved in the design, manufacture and operation of space-age aircraft and missile structures and powerplants?

Serious enough, when you consider that engineers are being forced to use (1) inadequately developed materials and (2) relatively unproven and expensive techniques for forming and joining them.

What's more, the various "heat barriers" are getting higher right along. The day isn't far off when we could be stopped from reaching new peaks in aerodynamic and powerplant performance. This will happen, too, unless we find better structural and insulating materials, and better ways to form and join them.

How High is "High"? — "High temperature," of course, has a different meaning for different people: 400-1500°F is high for the aircraft designer; 2000°F for the gas turbine designer; 4000°F for the ramjet designer; and 5500°F for the rocket engine designer.

For missiles, high temperature may be anything from 400°F to the 40,000°F stagnation temperature of a typical re-entry vehicle. Even a hypothetical anti-aircraft missile could have a stagnation temperature of 11,800°F, hotter by some 2000°F than the surface of the sun!

The structural temperature of a missile in transit is generally far below its stagnation temperature and can be controlled somewhat by changing material thickness, using insulating layers, or possibly by sweat cooling. Some idea of the control available by changing material thickness is shown in Fig. 1, where it seems there is little to gain by increasing the gage above some nominal value.

Creep is Key—Aircraft structural

Part II of this article, pinpointing our need for better high-temperature materials and forming techniques, will appear in next week's issue.

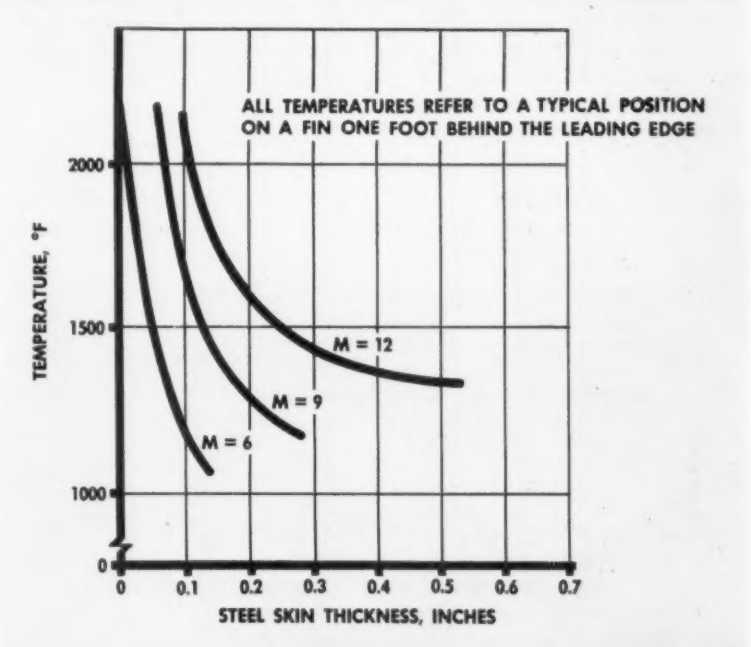


FIG. 1: Outside skin temperatures of three different re-entry vehicles at 30,000 ft. Increasing skin thickness beyond a certain point appears to have little effect in lowering the temperature.

temperatures will likely be lower than those of missiles, but they will be sustained for longer periods. This means that creep and high temperature fatigue may become controlling factors in structural design. For both aircraft and missiles, it's likely that creep or maximum permissible permanent deflections will limit material usage to stresses well below the ultimate strength available at any given temperature.

Many present day materials can be used at elevated temperatures and fabricated with well established techniques. Figs. 2 and 3 plot tensile strength and modulus of elasticity vs. temperature for a number of such products. But there are limitations and major-problem areas with both these older materials and the newer ones.

What About Aluminum? — For example, some commercial aluminum alloys will stand extended use up to 300-350°F. In fact, current missiles use aluminum compositions at temperatures up to 800°F for a few seconds, and to 550-600°F for a few minutes.

In another two or three years, new aluminum alloys and sintered aluminum products may be able to withstand 750-800°F for a few minutes. But any extended use will require much lower peak temperatures due to creep and aging effects.

Conventional forming, joining and machining methods will continue to apply to most aluminum alloys. But because sintered products require large bend radii, press forming possibilities are limited. Nor can these products be welded satisfactorily at present. Aerodynamic shapes may also have to be changed to suit the limited formability of sintered aluminum. To achieve much use, sintered products will have to be made stronger and more formable.

Some aluminum alloys, still in the laboratory development stage, show promise in the 500-800°F range. In this heat zone, they have about twice the strength of current aluminum-base materials; they also have fair creep resistance.

But if aluminum alloys are to be useful above 400-500°F, development must speed up drastically. Otherwise, operating temperatures will pass them by.

Magnesium is Promising—Magnesium alloys, mostly in the form of castings, are used at temperatures up to 650°F in certain missiles. Zirconium-magnesium and thorium-zirconium-magnesium compositions have good static and creep strength up to this temperature. Such alloys are very brittle at room temperature, however. This makes them hard to handle in the foundry or shop. It also hampers their use during normal temperature phases of flight.

Poor fluidity of these alloys also means a high rate of rejects due to misruns, cold shuts and alloy segregation. The alternatives: (1) use of heavier sections than are desirable, or (2) extensive machining.

With better room temperature characteristics and fewer foundry problems, magnesium alloys could be in line for a number of aircraft and missile applications, even when external temperatures get above 650°F. A hot-forming thorium-zirconium-magnesium sheet material has been developed that may prove useful. However, not enough of the product has been available to evaluate it properly.

Titanium Plays Part—Titanium structural parts are useful for short periods at temperatures up to 1000°F. At this heat the metal begins to oxidize rapidly. Its use for extended periods of time will probably be limited to the 700-800°F range due to poor creep resistance.

Titanium does not form readily into complex shapes at room temperature, although it is being hot formed successfully. Its machinability is poor, also, being comparable to that of quarter hard stainless steel.

Future developments in titanium metallurgy should be aimed at: (1) improving formability; (2) possible use of alloy additions to raise the oxidation temperature and improve creep resistance.

Another worthwhile goal is price reduction. At current prices, the high cost of finished titanium metal tends to discourage its extensive

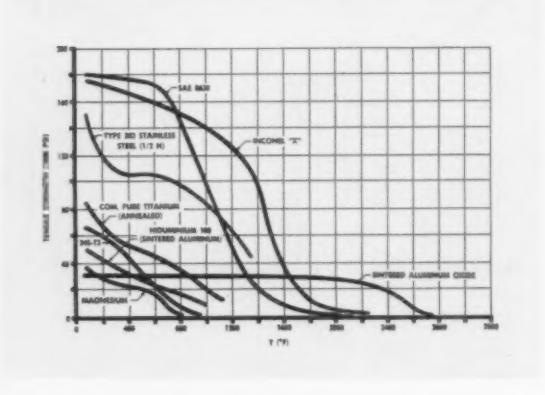


FIG. 2: Pattern of tensile strength vs. temperature for various materials used in aircraft and missiles.

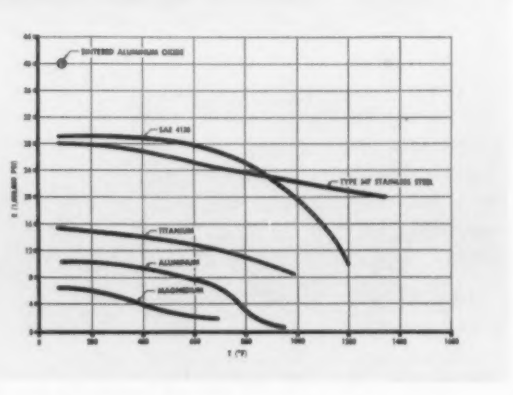


FIG. 3: Modulus of elasticity at elevated temperatures for typical structural materials.

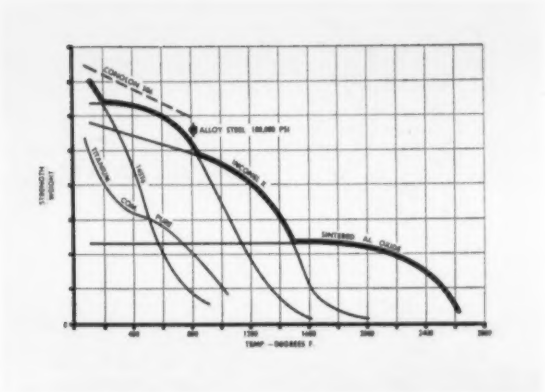


FIG. 4: Designers want new materials that will retain high strength-weight ratios for extended periods at elevated temperatures.

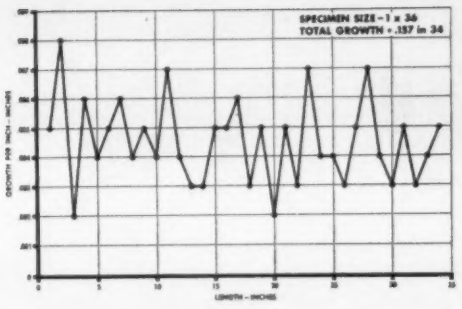


FIG. 5: Growth, resulting from 1050°F aging of solution annealed 17-7 PH stainless steel, varies from inch to inch.

use; the cost of using it instead of steel to save a pound of weight is about $75.

Douglas' experience shows that the uniformity of titanium, although improved considerably in the past few years, still leaves something to be desired. The firm still makes tensile, bend, notch tensile, dimpling and tear tests on material from each sheet it uses. Even this costly practice has not prevented some substandard material from finding its way into aircraft. Douglas does expect, however, that if uniformity continues to improve steadily, inspection can soon switch to a sampling basis.

Alloy Steel's Role—Alloy steels are relatively unpopular for high temperature use; they lose strength rapidly as operating temperatures reach the draw temperature of the material. However, for short time missile use, strength holds up well. Very favorable strength - weight ratios are possible in the 200-800°F range, as Fig. 4 shows.

But the use of stiffened, thin gage steel involves complex structural sections. Heat treating these, after they've been welded or joined in some other way, usually results in excessive distortion.

What's Needed—Protecting alloy steel surfaces from oxidation at temperatures above 600°F is a problem. Cadmium plating cooks off at about 550°F. Ceramic coatings are not only brittle, but add considerable weight if they're thick enough to give adequate corrosion protection. Less brittle ceramics are apt to become oxidized themselves.

Flame sprayed coatings of pure aluminum have had some success, it's true. But weight is a problem because a coating 0.005 in. thick is required.

For missiles, where storage is the key factor, a primer and enamel on steel give adequate internal protection. But for exterior use at high temperatures, the problem is rapid oxidation in flight. This occurs as actual burning well below the melting points of many materials, and loss of the base material produces still higher temperatures. At present, much effort is going into the development of suitable surface treatments.

Can't Waste Metals—There is need for either an air hardening or a low temperature, precipitation hardening, low alloy steel to minimize warping when thin sections are quenched. Precipitation hardening stainless steels meet this need, but they're too wasteful of critical alloying ingredients for extensive use in missiles.

Other major problems in using such materials as 17-7 PH are (1) non-uniformity, requiring different heat treating temperatures for each lot, and (2) non-uniform change in dimension after heat treatment, even within the same sheet of material, Fig. 7.

Such characteristics pose a serious manufacturing problem. Predrilling in the soft condition is desirable because of the hardness after heat treatment. However, matching of hole patterns and maintaining part interchangeability is almost impossible because of the material's unpredictable growth. Tooling is difficult because growth varies not only within a part, but from one part to another.

A lot of work is needed to improve uniformity in this type of material. In the missiles field, conservation of critical alloying elements calls for the development of leaner steels. They should have the age hardening properties of the 17-7 PH series, or be air hardenable to the 180,000-200,000 psi range.

Granted that steel makers can, in time, develop the alloy-lean heat-resistant steels that planes and missiles already need. There will still be the problem of quick, low-cost part fabrication.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept. The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Buffing Setup Increases Output, Saves Space

By Herbert Chase—Consultant, Forest Hills, N. Y.

Where you usually wind up adding more space to increase output, here's a fresh approach to buffing lines.

The answer lies in eliminating straight-line setups. Flexible buffing units do the job with short, fast cycles.

▪ New polishing machines at the Buick plant, Flint, Mich., adapt to many differing lengths and shapes of stainless steel moldings. Five straight-line and two rotary units buff a total of about 30,000 moldings each 16-hour day.

Even at such a high rate, the machines require one-third less space than the former straight-line polishers. For straight moldings the units require only two wheels. The others for curved parts use revolving tables with three wheels.

Starting as prepolished coil stock, the moldings go through blanking and forming steps. Handling in these operations results in scratches that must be removed by buffing.

After buffing, the parts receive striping. Here again Buick uses units that get uniform results on large volume output.

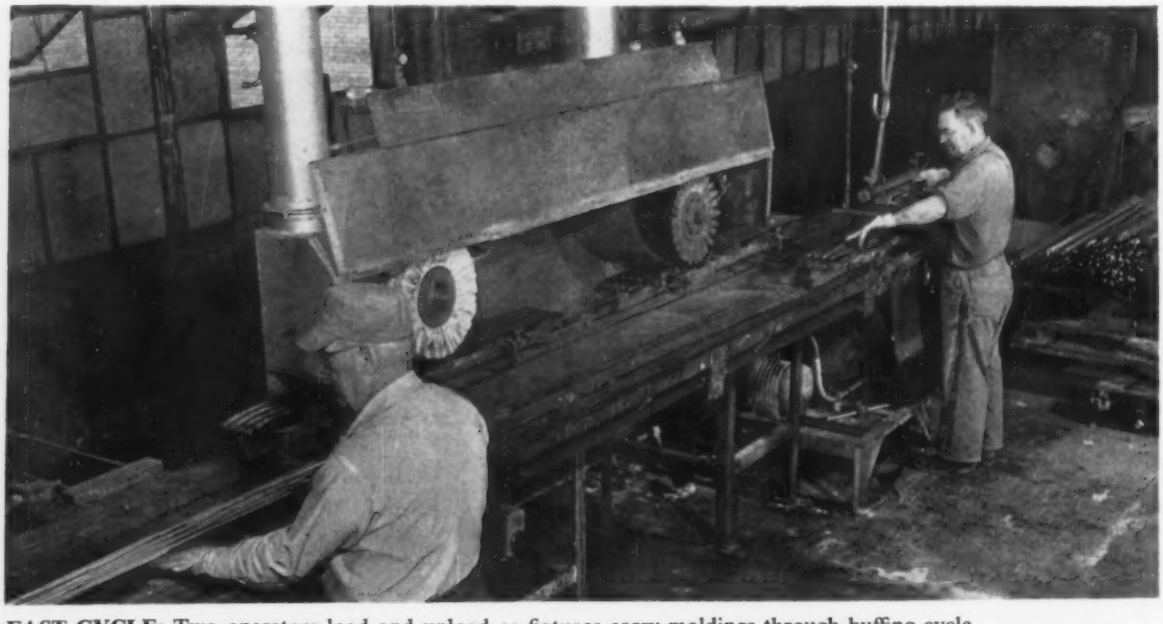
Dispense With Clamping — For straight moldings, supporting strips on the buffing fixtures hold the parts without clamping. Each fixture, holding four pieces, has a roller chain rigidly fastened at the base. Motor driven sprockets engage the chain to advance parts under the buffing wheels.

After loading a fixture, the operator positions it in front of an air ram. The ram pushes the fixture along a track until the front end of the chain engages the first sprocket.

As the fixture advances along the track, the moldings pass under each wheel. Spray guns apply Seifen water-base buffing compound to the wheels. The compound is fed only when the fixture actuates a trip. There's no need for bar compound.

Fixtures normally advance at 15 fpm, but can be run more slowly to get a longer buffing period. The exhaust removes excess compound, worn-off sisal, and particles polished from the moldings. Adjustable Acme heads drive the wheels at 2300 rpm.

At the end of the buffing period, the fixture actuates an air ram through a limit switch. The ram pushes the fixture to the unloading station. After unloading, the opera-



FAST CYCLE: Two operators load and unload as fixtures carry moldings through buffing cycle.

tor shifts the fixture to a belt that returns it to the loading station.

With fixtures holding three to four pieces, the machine processes 350 to 450 pieces an hour. Three men at each machine load, unload and pack moldings into boxes for transfer to striping stations.

Round Table for Curves — For curved moldings that depart from a straight line as much as 20 to 30-in. radius, buffing is done to better advantage on circular polishing tables. Fixtures are similarly curved to fit the moldings.

Each of three wheels is wide enough to buff two moldings. Flexible sisal finger buffs do a good buffing job even when wheel motion is not parallel to the molding.

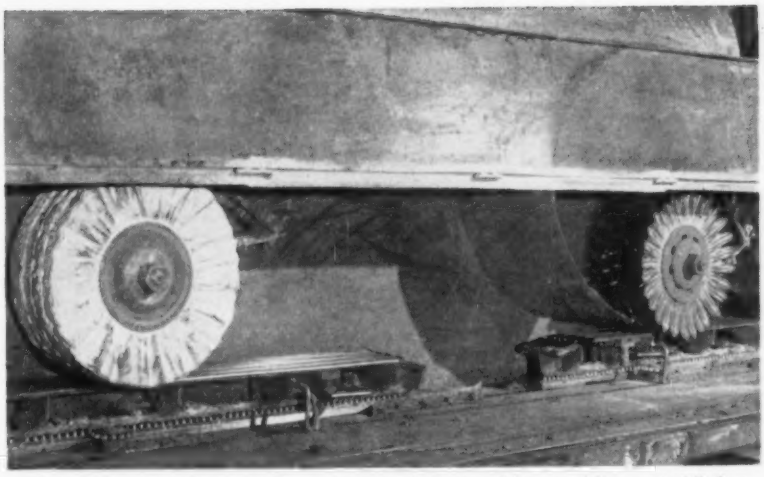
Rotation is normally continuous, since time for loading and unloading is always long enough for the fixtures approaching the buffs to be fully loaded. With three men handling loading, unloading and packing, the machine handles up to 550 parts an hour.

Acme heads drive the 17-in. wheels, each of which is hand adjusted to compensate for wear. An exhaust hood draws off dust and spent compound.

Uniform Striping — Treatments through a Udylite machine remove all traces of polishing compound and prepare the surface for paint adherence. The molding gets air-clamped over a mask on an automatic Spanski spraying machine. A Binks spray gun, advanced by a lead screw, applies a uniform stripe.

Except for loading and unloading, and for handling and cleaning the mask, the operator need only press a pedal to start the cycle. Air-operated plungers clamp the molding firmly against the mask. A cam guides the gun along the curve of the molding.

Since the creeping tendency of enamel increases with each spray, it's necessary to clean the mask after about 12 spray cycles. For this reason duplicate masks are provided for each molding. By switching masks, each machine stripes about 300 units an hour.



TIMED BUFFING: Sprockets engage chain to drive moldings at 15 fpm. Fixtures trip switches to actuate spray nozzles at each wheel.

FITS THE CURVES: Circular table moves continuously as three buffing wheels finish curved moldings.

AIR PLUNGERS CLAMP: Molding fits against mask as automatic spray gun sprays stripe from under side.

How to Measure the Effects Of Slack-Quenching

In the heat treatment of steels, slack-quenching is usually a pitfall you try to avoid.

But when the effects of slack-quenching are carefully measured and controlled, it may turn out to have a few real assets. Here's a first-hand account of how these effects may be measured.

▪ Although slack-quenching has always had its quota of unwilling practitioners in the heat treating field, its friends and admirers are virtually nonexistent.

Especially with steels, most heat treaters avoid slack-quenching whenever possible. Their reason: it produces a mixed microstructure, mixed hardness, and mechanical properties that vary continuously throughout the metal.

But there seems now to be a chance that the old culprit may turn out to be a hero in disguise. For slack-quenching — when properly controlled—may have very definite merits.

Added Expense — Until now there has been little information on the properties of slack-quenched steels. Rather than risk the unknown, manufacturers have sidestepped the slack-quenching problem by substituting deep hardening alloy steels for the less expensive carbon grades. This means an added expense that isn't always easy to justify.

The National Bureau of Standards has recently developed an accurate method for measuring the effect of slack-quenching on the impact resistance of steel. Devised by M. R. Meyerson and S. J. Rosenberg of the Bureau's thermal metallurgy laboratory, the procedure uses a Charpy impact specimen which has been immersion end-quenched.

Important Savings—The quenching forms a series of planes having different but predictable microstructures and hardnesses, depending on their distance from the quenched end. The depth of immersion and type of quenching medium used are predetermined from data obtained from an end-quenched Jominy specimen of the steel under study.

This method of controlled slack-quenching should help to determine in what circumstances slack-quenched steels may be used. It should lead to a broader understanding of the impact properties of steel as affected by microstructural variations. It may also contribute to important savings in critical materials by reducing overdesign.

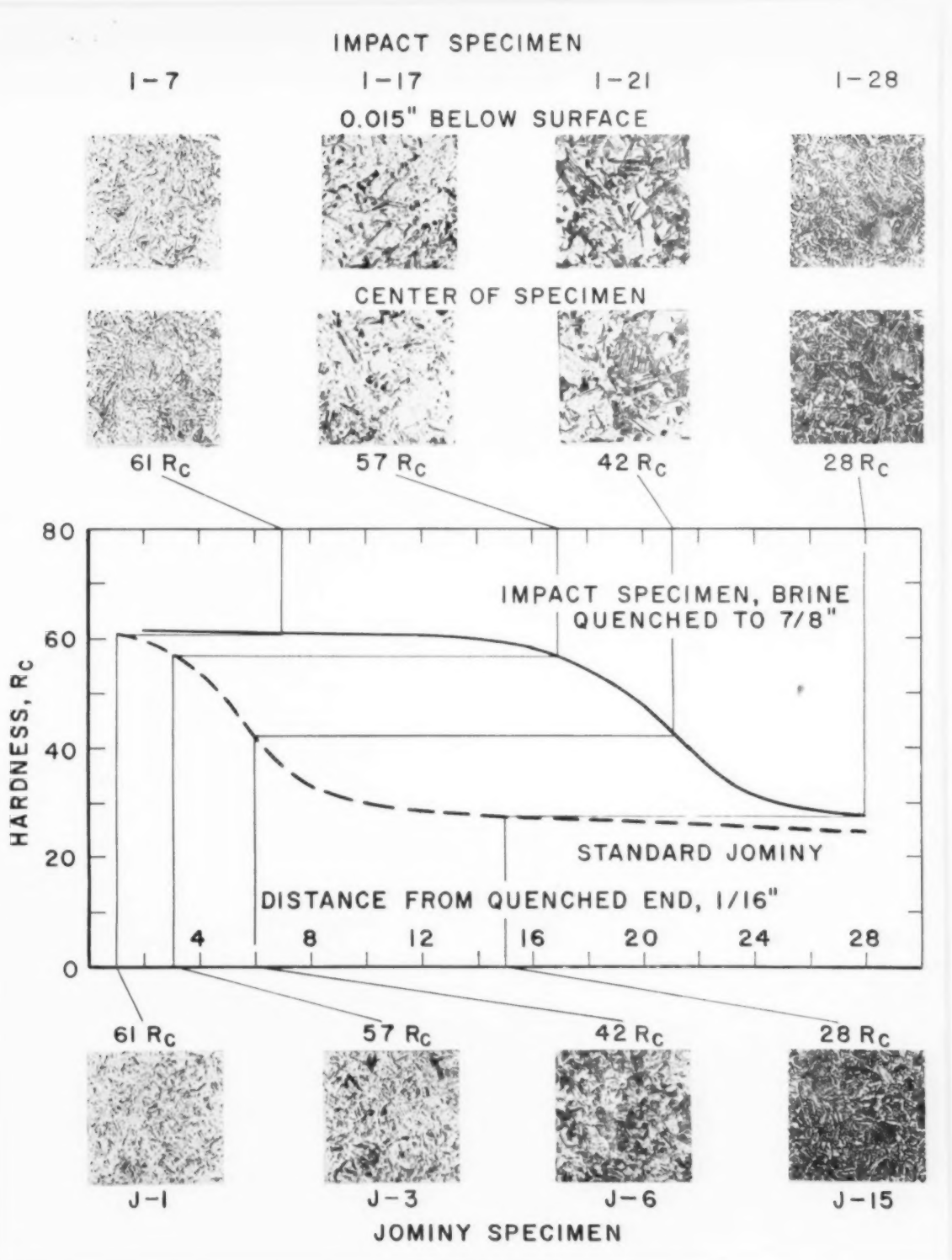
Good Correlation—It was reasoned that impact specimens having slack-quenched structures might be prepared in a manner similar to that of Jominy specimens. A Jominy specimen is hardened by a jet end-quench. In theory, it contains a number of parallel planes. Assuming no surface cooling, each plane is cooled at a constant rate decreasing in speed with increasing distance from the quenched end. As a result, each plane has a different hardness and microstructure.

A series of quenching and hardness tests were made on end-immersed impact specimens and Jominy specimens of the same steels. The microstructure and hardness existing at selected distances from the quenched ends were correlated.

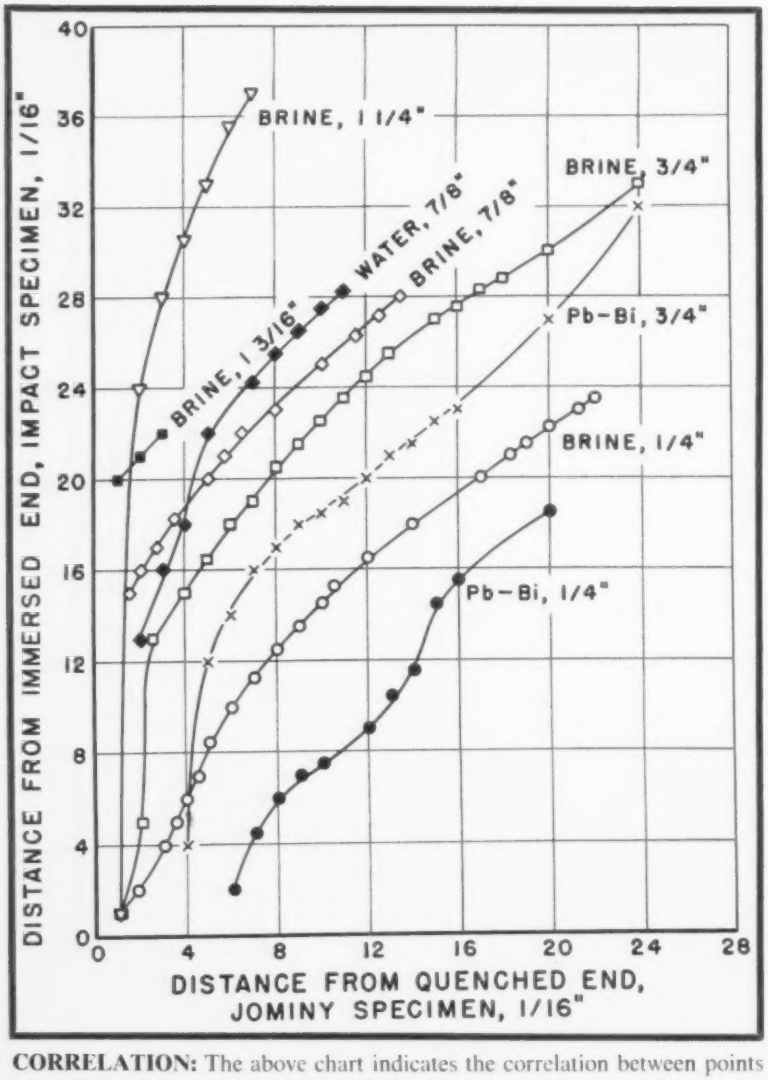
Test Method—The data showed a distinct relationship between hardness and structure at specific planes in the two types of specimens. This information was reduced to graphical form for easy reference.

In studying impact properties of slack-quenched structures, a stand-

HERE'S HOW: As part of the test program, an impact specimen is held at opening in quenching fixture immediately after removal from furnace. A second specimen (left) is end-immersed in brine. Metal straps fasten the steel plate in position above quenching bath.



MICROSTRUCTURES: Plotted above are hardenability curves and microstructures at equal hardness levels on an impact specimen and a standard Jominy specimen. The microstructures of both are the same at equal hardness levels. Note that microstructures of the impact specimen are uniform from just below the surface to center. A close relationship exists between hardness and micro structure in both types.



CORRELATION: The above chart indicates the correlation between points of equal hardness on end-quenched Jominy specimens and end-immersed impact specimens of the same steel. The plotted points represent locations of equal hardness and similar microstructure.

ard Jominy bar of the steel under test is first end-quenched according to ASTM specifications. A hardness survey along the length of the specimen is correlated with the microstructures. Once the desired hardness or structure is located in the Jominy bar and the distance from the quenched end measured, the graph may be used.

For example, you might want to study the impact properties of specimen having the microstructure that exists 8/16 of an inch from the quenched end of a Jominy bar. The graph indicates that an impact specimen immersed to ⅞ in. in brine will have the desired hardness and structure at 23/16 in. from the immersed end.

Specimen Preparation — If the specimen is immersed only ¾ in., the desired structure will appear at 20/16 in. from the quenched end. In this case, either immersion depth may be used since the notch used in impact tests must be located close to the center of the specimen and at least 1.08 in. from the quenched end.

After quenching, the specimens may require a low temperature stress relief (250°F) to prevent subsequent cracking. Then the specimens are ground equally on all sides to remove any scaling and decarburization that may have occurred. A hardness survey made on one face locates the desired slack-quenched structure. A standard V-notch is cut into the specimen at that point.

Finally, the ends of the specimen are cut off at a distance of 1.08 in. on each side of the notch. The impact resistance at that particular plane may then be determine by the Charpy impact test.

Numerous hardness and metallographic surveys were made on impact specimens from center to surface, after removal of the decarburized layer. These established the uniformity of hardness and microstructure in any plane above the immersion level and parallel to the quenched end.

Impact Bars—In making the impact specimens, they are first rough-machined to a size slightly larger than the standard impact specimen. The extra stock allows for scaling and decarburization during heat treatment. It also permits some latitude in locating the notch.

One end of the specimen is drilled and tapped to accommodate a ¼-in. length of a ½-20 screw, 2 in. long. A washer, locked in a selected position by two nuts, supports the specimen in a fixture.

Thus, a predetermined length of the specimen may be immersed vertically in a brine, water, or other quenching media. The fixture is made of ¼-in. steel plate. The plate is drilled with holes to take care of 8 specimens.

Tempered, Too — This same method is suitable for the study of tempered as well as untempered slack-quenched structures. When dealing with tempered specimens, a predetermined tempering treatment is given the specimen after locating the selected slack-quenched hardness on the untempered specimen.

Model Production Control Setup Benefits Small Firm

By R. H. Eshelman—Engineering Editor

There's no excuse for a small firm to have an excess of production tieups or delayed shipments to customers.

Not when it can tailor big-plant ideas for its own use.

That's the thinking at Formsprag Co. Its production and quality control setup reflects this approach.

▪ Production in the smaller plant must usually be geared to varying quantities and a wide range of parts. Holding down costs and planning efficient operations isn't easy. The high mortality rate among smaller firms attests to this.

Effective controls often spell the difference between profit and loss. An efficient small manufacturer, Formsprag Co., of Warren, Mich., shows how it can be done.

The company produces overrunning clutches of a unique sprag-type design. Standard clutches of this type are used for a variety of indexing, backstopping and overrunning applications. In addition to maintaining sizable stocks of standard products, an important part of the company's business is developing and producing special clutches.

Job Lot Scheduling—Quantities

VISUAL AID: Production control chart shows status of all jobs in the shop at a glance. Chief planner John Hamm posts a change by relocating a card.

EASY TO FIND: Tools stored in orderly fashion and according to numbered records are quickly located in tool stock room.

of these special items vary from a handful to thousands. To schedule these job lots while maintaining output of the staple line is no small feat. Complicating factors are the high precision specified for some products and the need for meeting delivery dates. The answer lies in controls—of materials, production and quantity.

To streamline operations, the company minimizes paperwork and tries to get the most mileage from each piece of paper. Forms are kept simple and each one serves several uses. For instance, the sales order triggers both engineering and production activity.

Where Engineering Begins — When a copy of this form reaches the engineering department it signals the start of the design study. Many special items require further contact with the user about cost, materials or design factors. This is handled through the sales department. Any changes are noted on a revised sales order. When the design is finally set, engineering sends drawings with a copy of the sales order to process engineering.

Processing and Tooling—Process engineers then work out the correct production operations and sequences. They use routing sheets which list operation numbers, machines, job descriptions and related data. They also determine the tooling needed and prepare drawings for the shop to use in making the parts.

Many plants figure the volume of their tooling doesn't warrant records and controls. Not so here. Every tool is numbered and catalogued on a stock room record sheet which tells its location, type and the operation it's intended for. This pays off in faster scheduling, elimination of time lost in hunting for tools and better condition of tools when they are taken out of storage.

Planning Production — Using process routing sheets, engineering and manufacturing drawings, sales order information and related data, the materials control department orders the necessary raw stock into the plant. This group works with design, process and production personnel to get the best and most economical materials. It also prepares the factory work orders which authorize actual production.

TURRET CENTER: Machines of similar capabilities grouped together make scheduling of production easier.

Scheduling of manufacutring operations is the responsibility of the production planning department whose office is right on the shop floor.

Since production planners schedule a large number of runs of various lot sizes, they need to have an overall picture of job progress in the shop. A large graphic scheduling board on the office wall helps them keep track of each and every order. This chart also gives a current picture of the job mix throughout the shop.

Machine Capability Important— Production manager Leo Zaremba has organized like machines and operations in shop "centers." Turret lathes, for instance, are grouped for the setups and precision ranges they can handle best. This simple idea is another practical way to improve and control quality.

The plant arrangement and the visual control board simplify the scheduling problem, also. When the factory work order, routing sheet and related information first come to the production planners they prepare machine loading cards. One goes on the wall chart, which holds the records for two weeks' schedules. (The complete shop load for the next six months is carried in a separate file.) Using the chart, planners are able to route orders through the shop on a schedule to meet desired delivery dates.

When necessary, they reschedule orders for standard and stock items to meet tight delivery dates on specials. They also time shop work to mesh with work sent outside, such as heat treating or plating. Shop-move orders show the planners when groups of parts go from one operation center to the next. Posting these keeps all schedules up to date.

The success of this key scheduling function lies in knowing just how any piece of shop equipment will produce in terms of volume and precision. Here, the grouping of machines by age and condition has really paid off: The company meets delivery dates promptly, maintains

a more even work load in the shop, and gets a higher degree of machine utilization.

Flexibility in Production — To guard its record of meeting scheduled delivery dates, management constantly seeks to improve shop operations. For example, the firm worked with suppliers to develop a way of drawing rod to the eccentric cross sectional shape that sprag designs require.

This rod is bought in 10, 12 and 14 ft lengths and is cut to lengths specified for each clutch design. Working with machine builders, the company automated this cutoff operation with spectacular savings and reduction of scrap.

Since sprags are the highest volume parts, other operations on them were given a second look, also. One result is a setup for automatic grinding of slots. Simple yet versatile tooling permits quick setup changes for handling a considerable range of sizes. This improvement boosted slot grinding production 300 pct. without additional personnel.

Assembly Timing—At one time, also, slow bench methods of clutch assembly sometimes complicated delivery dates. Production engineers solved this problem by fitting a spare piece of equipment with an indexing table plus a sprag orienting and feeding tower. The machine now assembles the more common sizes of clutches mechanically.

This change brought a 600 pct gain in assembly output over the bench method with no personnel changes. Cost of the equipment was $3000. Estimated payoff time on the investment is only two months on a one shift basis.

Best of all, this setup made scheduling of assembly more flexible. Now this creates no special headaches for production planners. When they find that all the parts on a work order have cleared final inspection and that purchased parts are in the stock room, they schedule assembly of the end product. When necessary, standard clutches can be set aside while special items are cleared through.

MECHANIZED ASSEMBLY: Automatic orienting and hopper feed of sprags greatly speeds assembly of larger production runs.

Formsprag's visual production control system also yields some interesting side benefits. It quickly shows when a group of machines is falling behind schedule due to machine breakdown, absenteeism, inadequate tooling, poor setups, or any other reason. Also, it points out overloads at particular centers. And it tells when more equipment or overtime is necessary. Finally, by flagging what's scheduled to be shipped, it's possible to determine dollar volume for each month.

Quality Controlled Too—Quality methods in the shop are on a par with those used in the largest plants. Commercial parts are inspected by sampling techniques. Aircraft parts, on the other hand, are 100 pct inspected.

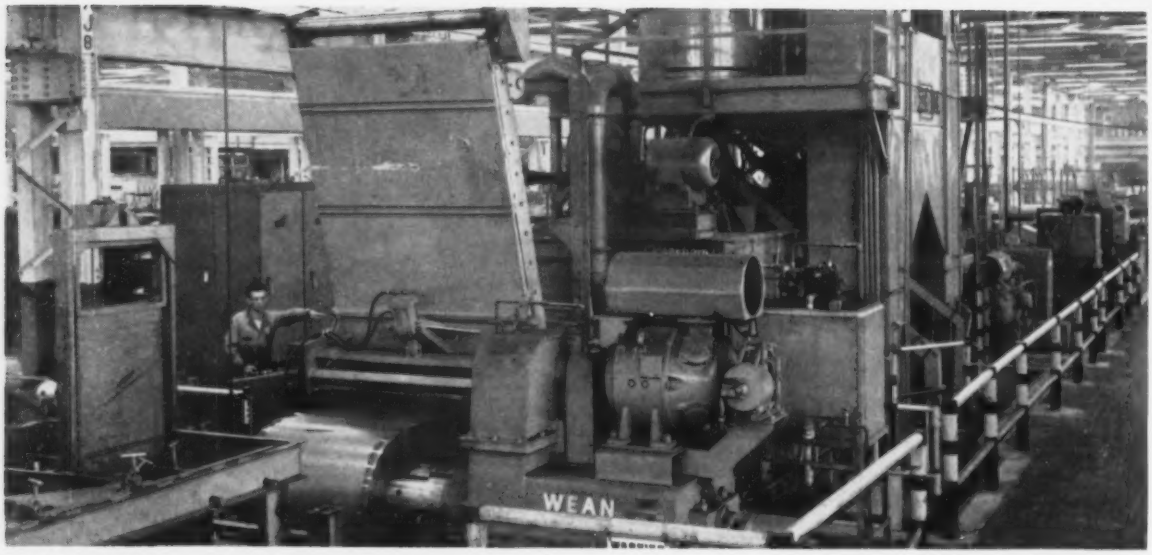
The company uses special gages to cut human fatigue in inspecting large volumes of small pieces. Moreover, the inspection department is isolated from production pressures; it reports to the vice president of engineering.

An important feature of the quality control program is functional testing. All clutches get a run-in on a bench setup before shipment. This gives final proof of proper assembly.

Controls To The Door—The factory work order held by the production planning group, and the sales order held by materials control, give a complete record of final shipment. When the finished product is packaged and shipped the planning group pulls its record. The record goes, along with the shipping memo copy of the sales order, to the materials control department. This ends the planning group's responsibility.

These door-to-door controls over plant operations play a big part in attaining day-to-day efficiency. Things don't get lost, whether they're a few small pieces on a special order or an inexpensive, quick-run tool.

Even more important than the methods are the personnel that make them work. Few of the techniques reported are unique. They're just good practice. Progressive thinking from the top down keeps the company competitive.



AUTOMATIC CLEANING: Integrated line removes scale from coil stock with sheet conveyor raised.

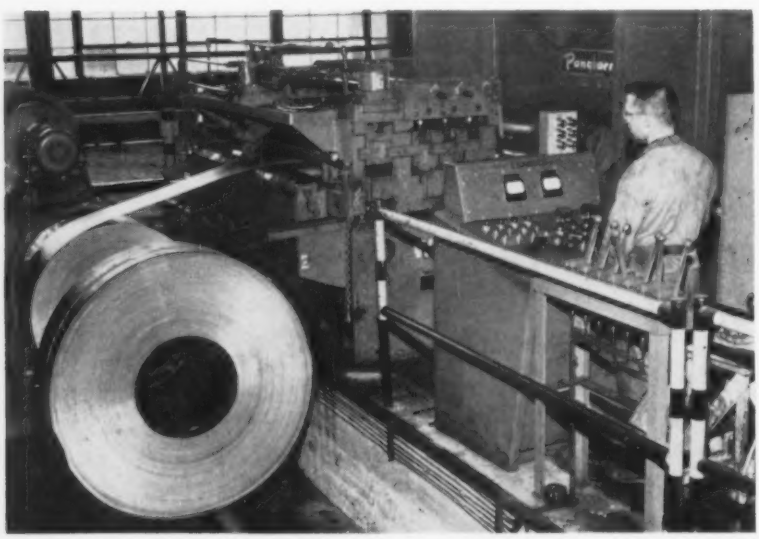
Descaling Line Cuts Stock Costs

When you're searching for a way to reduce product costs, it pays to take a close look at materials processing steps.

It's a matter of annual stock needs, savings differential, cost of equipment, and period of amortization.

▪ Versatility plays a big part in the success of a new descaling operation. With a few changes the line converts to handle either coil stock or sheet in a variety of sizes.

The new line at the Oldsmobile plant, Lansing, Mich., removes rolling mill scale from hot-rolled stock. There's no need to pay extra for pickling.



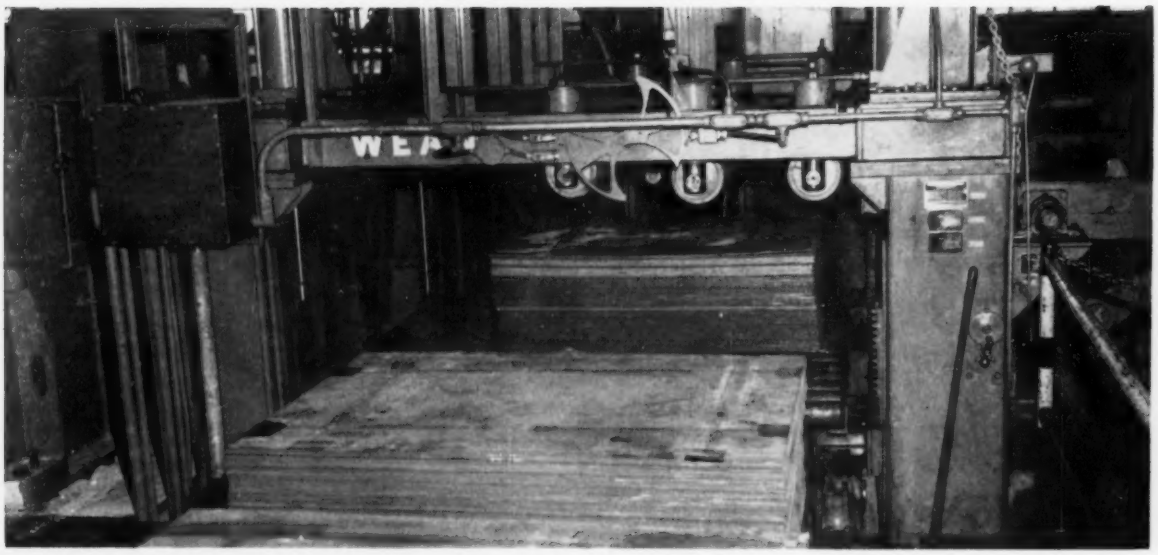
COIL FEED: With sheet transfer conveyor raised, strip uncoils into flattener rolls, then goes to cleaner.

Responsible for coordinating the installation of the units is C. A. Bultman, Pangborn Corp., Hagerstown, Md. Oldsmobile gets the benefit of his experience as a pioneer in the field of descaling operations. Mr. Bultman, recently retired, continues his work as consultant for Pangborn.

Short Loading Time—Both coil and sheet feeds are automatic to give continuous production. To avoid stoppages for adjustment and maintenance of the shearing and slitting machine, shearing and slitting is done on a separate line. Through a central control pulpit, the operator controls all cleaning and pass line speeds.

At the entry end, a roller leveler flattens coil stock before passing it through the shot blast. About 85 pct of the work is in form of coils weighing up to 30,000 lb.

For sheets, once the stack feeder is set up for a particular size, the unit loads without interruption. Sizes range from 18 to 60 in. wide and from 1/16 to 5/16 in. thick.



MAGNETIC PICKUP: Cut sheet, positioned mechanically on feeder, gets magnetic pickup, one sheet at a time.

Tracked dollies bring stacks to the feeder, while an operator at a separate control pulpit at the entry end of the line controls the loading.

Bypass Coil Units — Magnetic rollers pick up sheets singly and feed them across a conveyor bridge above the uncoiler unit. The strip flattener is merely loosened for sheet operations. At the exit end, another crossover conveyor sends the sheets to a stacker beyond the recoiler unit.

The two bypass conveyors are hinged to isolate both sheet feeder and stacker when coil stock is run. Positioned in front of the recoiler, an oiler lubricates both sides of stock simultaneously. An edge positioner compensates for lateral float to rewind coils with even edges. It aids slitting and stamping operations later on.

Handling arrangements, engineered by Wean Equipment Co., have a number of safety controls. These prevent malpositioning or feeding of more than one sheet at a time.

Balance Stress—The eight-wheel shot blast machine descales both sides of stock at same time. It avoids distortion and equalizes any prestressing effect.

Four wheels are located above the pass line and four below. Each wheel is angled 12° from vertical to get a better cutting angle, minimizing rebounding of abrasive. It holds the self-destructive effect of the blast stream to low limits. A shut-off control insures that abrasive flows only when stock moves through the machine.

For adjusting blast stream patterns, push buttons at the main pulpit control the lateral movement of the wheels. In this way patterns adjust to width of strip being descaled.

Ammeters in each drive-motor circuit indicate rate of abrasive flow to each wheel for visual control of the descaling operation.

Prevents Scratching—The roller conveyor in the blast machine is rubber covered. Hold-down rolls are a floating type to prevent embedding of abrasive and scratching of stock. Roll weight is kept constant regardless of width or gage.

A positive blower at about 2 psi removes accumulated abrasive from top of stock as it passes through the exit. A secondary cross blow insures that no abrasive will pass on to the oiling unit.

Abrasive gathering hoppers send spent abrasive by elevator to separators for removal of scale and dust. The cleaned abrasive goes to a storage bin for reuse.

Dust collection is continuous. The self-cleaning unit maintains constant air movement through exhaust connections and abrasive separators. Accumulated dust is unloaded with the exhaust fan stopped. Powered valves at bottom of the dust hoppers meter collected dust into a screw conveyor for disposal.

What Abrasive Mix—Shot size determines fineness of surface finish. Because of variations in stock and scale, Olds production engineers experimented with various mixtures. They find a mixture of 600 lb of No. 110 steel shot with 170 lb of No. 200 shot does the best job. In an 8-hour shift the rate is about 10 lb per hour per wheel.

Lubricant for stock preservative and preform coating also required some study. They settled on a mixture of lard and soluble oil.

Tenacity of scale proves to be the greatest variable. It's reflected both in descaling costs and production rate. Some stock goes through at 120 fpm, while others can only be handled at 60 fpm.

Sintered Metals Approach Properties of Wrought Alloys

Much of the recent effort to improve powder metals has been aimed at higher pressures. Meanwhile, some firms have tackled the problem by improving raw materials.

The result is an important breakthrough—ferrous alloy powders that attain properties approaching those of wrought materials in a single, simple press-sinter operation.

■ A new family of powdered iron and steel alloys is narrowing the gap between powdered metal parts and machine-wrought products. The Steelmets, as they're called, make it possible to produce low-cost sintered parts with properties comparable to a host of items now being made exclusively by expensive machining methods.

The Steelmets are expected to break bottlenecks and cut costs in the manufacture of gears, cams, levers, pawls, ratchets and many other parts for high-stress applications. P. R. Mallory & Co., Inc., which developed the new materials, reports that one small part now being made of Steelmet was costing more than four times as much by machine-wrought methods.

While details of their manufacture haven't as yet been revealed, Mallory says it makes the new materials from low-cost grades of commercial iron powders. By a series of thermal, physical-chemical and mechanical steps the Indian-

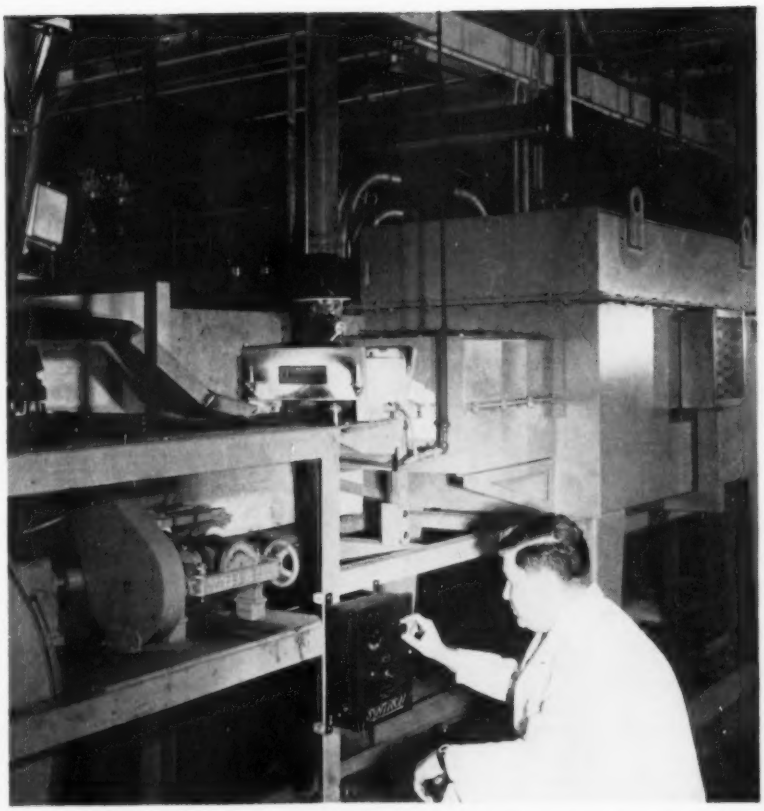
STRONG AND DUCTILE: Gear and twisted steel bar were made from the same composition of alloy powder.

apolis firm arrives at a variety of ferrous alloy compositions which can be converted in a single pressing and sintering operation into parts which are at least 95 pct dense.

Saves Steps — Thus, the new powders eliminate more expensive techniques such as copper infiltration, multiple pressing and sintering, and hot pressing—the usual ways of attaining high density.

Scores of new ferrous compositions have already been made by the Mallory process. As shown in Table I, they range in strength from 42,000 to more than 200,000 psi, and in elongation from 36 down to 1 pct. Initially, however, only four major types are being put in pilot-plant production. These are Steelmet 100, 101, 302, and 600.

Steelmet 100 is a general-purpose 98 pct Fe alloy with good tensile strength and excellent ductility; it can be carburized and heat treated. Steelmet 101, a high-nickel ferrous alloy, offers high tensile strength and good ductility; it can also be



PILOT PLANT: Part of the Mallory process in which cheap grades of iron powders are converted to Steelmet alloys is treatment in this atmosphere furnace at the firm's pilot plant in Indianapolis.

TABLE I | Experimental Sintered Alloys Made by Mallory Process

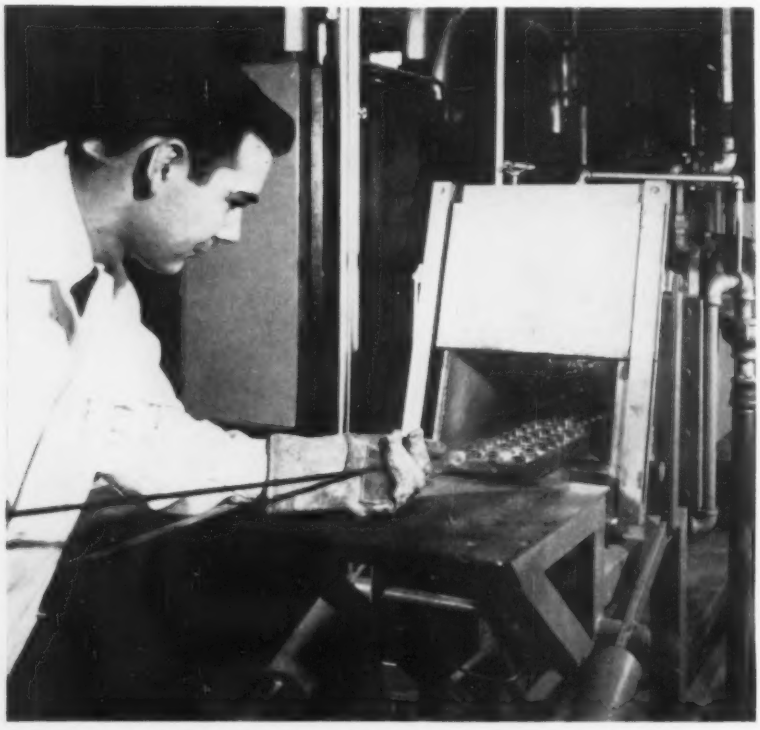
Composition (Wt. pct)—Balance Fe	Density gm/cc	Density as pct TD	Post-Sintering Heat Treatment	Ultimate Tensile Strength, psi	Elongation, pct in 1 in.
17 Cr, 8 Ni, 1 Mn, 0.55 Si (Stainless 302)	7.6	98		85,000	34
12 Cr, 1 Mn, 1 Si, 0.06 C (Stainless 410)	7.5	98		80,000	20
24 Ni, 12 Mo, 8 W, 20 Cr, 20 Co	8.5	96		86,000	15
26 Mo, 66.5 Ni (Hastelloy B)	8.7	96		100,000	27
5 Cr, 4 Ni, 2.5 V, 1.5 Si	7.1	95	Oxidized 748 hr at 1250°F	81,000	13
5 Cu, 5 Ni	7.6	95		140,000	6
6.5 Cu, 1 Ni, 0.14 C	7.6	96		138,000	5
6.5 Cu, 1 Ni, 0.14 C	7.6	96	Annealed at 1330°F	102,000	11
0.25 Ni	7.7	98		42,000	36
1 Ni, 1 Mn	7.8	99		53,000	34
1 Ni, 1 Mn, 0.32 C	7.5	96		116,000	4
1 Ni, 1 Mn, 0.32 C	7.5	96	Quench hardened	204,000	3
0.5 Ni, 1 Mn, 0.4 C	7.6	98		77,000	17
0.5 Ni, 1 Mn, 0.4 C	7.6	98	Quench hardened	146,000	4
1 Ni, 1 Mn, 0.59 C	7.4	96		120,000	3
1 Ni, 1 Mn, 0.59 C	7.4	96	Quench hardened	206,000	3
1 Co, 9 Ni	7.6	95		85,000	15
8 Co, 1 Ni	7.7	97		54,000	30
15 Co, 0.5 Ni	7.7	96		63,000	20
1.2 W, 1.2 Mo, 5 Cr, 1 Ni, 0.3 Mn	7.5	95		91,000	7
1.5 Ni, 0.2 Mo, 0.45 Mn, 0.23 Si, 0.3 C (SAE 4630)	7.5	96		113,000	3
1.5 Ni, 0.2 Mo, 0.45 Mn, 0.23 Si, 0.3 C (SAE 4630)			Quenched, tempered at 600°F	204,000	1
1.5 Ni, 0.2 Mo, 0.45 Mn, 0.23 Si, 0.3 C (SAE 4630)			Quenched, tempered at 900°F	177,000	3
3.5 Ni, 0.7 Mn, 0.28 Si, 0.3 C (SAE 2330)	7.5	96		96,000	8
3.5 Ni, 0.7 Mn, 0.28 Si, 0.3 C (SAE 2330)	7.4	95	Quenched, tempered at 1000°F	121,000	3

Table II Properties of Four Major Steelmets*

	Steelmet 100	Steelmet 101	Steelmet 302	Steelmet 600	
Composition	1 Mn-1 Ni-Fe	9 Ni-1 Mn-Fe	302 Stainless	2 Cu-0.25 Ni-Fe	
Condition	As Sintered	As Sintered	As Sintered	As Sintered	Precipitation Hardened
Density, g/cc	7.5-7.6	7.5-7.6	7.4-7.6	7.5-7.6	7.5-7.6
Theoretical Density, pct	95-96	95-96	96-98	95-96	96-96
Ultimate Tensile Strength, psi	50,000-55,000	78,000-82,000	75,000-90,000	68,000-70,000	85,000-90,000
Yield Strength, psi. (1)	30,000-35,000	68,000-70,000	35,000-37,000	52,000-55,000	82,000-88,000
Elongation, pct (2)	30-20	12-8	30-15	20-16	7-3
Rupture Modulus, psi	Too Ductile to break	260,000	182,000	220,000	226,000
Hardness, Rb	53-55	88-90	80-90	78-81	92-96
Izod Impact, ft lbs	10	6	22	8	2
Unnotched Impact (ft lbs)	55	Bent Only	90	Bent Only	60
Fatigue Strength, psi (3)	27,500		35,000	37,500	

NOTES: (1) Yield strength is taken at 0.2 pct offset. (2) Standard MPA bar has 1 in. gage length. (3) Tests were for 10^7 cycles.

* Made by single pressing and sintering



STRUCTURAL PARTS: Flanged bushings made of Steelmet powdered iron alloy are removed from sintering furnace at Mallory's research lab.

carburized and heat treated. The ratio between yield strength and tensile for this alloy is about 0.9.

Like Wrought Stainless — Steelmet 302 is equivalent to wrought 302 stainless steel in analysis. It has as-sintered tensile strengths of 75,000 to 90,000 psi and elongations between 15 and 30 pct in 1 in. And finally, Steelmet 600 is a copper-containing ferrous alloy which can be precipitation-hardened to increase its tensile strength from 70,000 to 90,000 psi and still retain moderate ductility.

Properties of these four major types are summarized in Table II. Each of the alloys is produced without carbon addition or copper impregnation.

All of the powder compositions made by the new Mallory process can be pressed at 30 to 50 tons per sq in. to form compacts with excellent green strength; they can then be sintered in one step to densities above 95 pct of theoretical under commercially acceptable conditions. And because their green strength is so good they can be compacted at high output rates in automatic presses.

Improve With Heat Treat—Some of the alloy compositions which have been made are improved by heat treating. A good example is the Mallory version of AISI 4630. Quenched and tempered at 600°F it has an ultimate tensile strength of 204,000 psi, which is 77 pct higher than as-quenched commercial 4630 powder metal alloy.

Mallory Steelmets 101 and 600 have tensile strengths of 75,000 psi and elongations of 8 to 20 pct. Strengthwise they're similar to SAE Type 7 steel, but elongation values are much higher.

Sintered Steelmet 100 has ultimate tensile strengths of 50,000 to 55,000 psi and elongations of 20 to 30 pct; these properties are obtained without the multiple pressing and sintering operations required to create similar properties in electrolytic iron.

FOR SPRING STEEL FASTENERS

QUALITY BEGINS WITH SHARONSTEEL

The manufacture of fasteners requires steel of the most exacting analysis. Spring quality steels of just the right degree of hardness to permit volume manufacture of hundreds of complicated and complex shapes.

Leading fastener manufacturers look to Sharon as a first source of supply because they have learned they can rely on Sharon to deliver finest quality to precise specifications — coil after coil.

SHARON STEEL CORPORATION

SHARON, PENNSYLVANIA

171

FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 97.

Refractories

A 20-page guide tells how to select special refractories. It covers castables, cements, ramming mixes, and patches. (Chas. Taylor Sons Co.)

For free copy circle No. 1 on postcard, p. 97

Set-up Tools

Component parts for jigs, fixtures and special machinery are featured in a 16-page catalog. (Northwestern Tool & Engineering.)

For free copy circle No. 2 on postcard, p. 97

Combustion Units

High frequency induction units and accessories for rapid high temperature combustion of laboratory samples are dealt within a 12-page catalog. It reviews single and two station combustion units for analysis of carbon, sulfur and hydrogen in cast iron, carbon steels, alloys, titanium, coal, coke, etc. In addition, it outlines units for making sulfur determinations on materials such as diesel fuels, kerosene, oil sludges and lubricating oils. (Lindberg Engineering Co.)

For free copy circle No. 3 on postcard, p. 97

High-vacuum Valves

A data sheet describes "a major advance in high vacuum valve design." It tells how a new 6-in. valve has a new thin design incorporated with proved performance features. (Vacuum Research Co.)

For free copy circle No. 4 on postcard, p. 97

Power Transmission

Built to last a lifetime are one maker's flexible couplings for maintenance-free power transmission. A 4-page bulletin describes two types of semi-floating shaft couplings for radial loads. (Thomas Flexible Coupling Co.)

For free copy circle No. 5 on postcard, p. 97

Gate Valve

All-plastic gate valves for service with corrosive or abrasive liquids are covered in a 4-page booklet. (Vanton Pump & Equipment Corp.)

For free copy circle No. 6 on postcard, p. 97

Deaerator

A tray type deaerator for removing corrosive gases from boiler feed water is described in a bulletin. It covers units with effluent capacities of 18,000 to 2,000,000 lb/hr. (Allis-Chalmers Mfg. Co.)

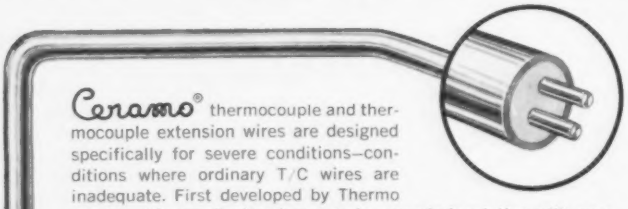
For free copy circle No. 7 on postcard, p. 97

Dynamic Balancing

How you can pinpoint trouble in plant and production machinery and solve balancing problems is told in a 4-page bulletin. It describes equipment which foretells, pinpoints, and isolates trouble in machinery easily and accurately,

Ceramo® Thermocouple Wire Meets Severe Conditions

Where Durability, Hi-Temp Resistance Are Needed



Ceramo® thermocouple and thermocouple extension wires are designed specifically for severe conditions—conditions where ordinary T/C wires are inadequate. First developed by Thermo Electric, "Ceramo" wires incorporate ceramic insulation with overall metal sheathing. They'll solve your problems of high temperature, abrasion, chemical or corrosive action, pressure and difficult installation. You can bend them to almost any shape. As extensions, you can often use them without conduit. And under these conditions they'll outlast comparable standard types many times—with no significant difference in response. Choice of conductors in all standard calibrations and various sheath materials for temperatures up to 3000°F. Conductors—36 to 12 gage. Overall diameters—1/25" to 7/16" for thermocouples; ⅛" and ¼" for extensions.

Write for Bulletin No. 31-300-N

Thermo Electric Co., Inc.
SADDLE BROOK, NEW JERSEY
In Canada—THERMO ELECTRIC (Canada) Ltd., Brampton, Ont.

without the trial and error method. It also illustrates how in-place dynamic balancing can be performed without costly dismantling of machinery. (International Research and Development Corp).

For free copy circle No. 8 on postcard, p. 97

Timing Devices

Electrical timing and control devices are announced in a data sheet. The sub-miniature, hermetically sealed elapsed time indicators operate on 115v, 400-cycle motors (The A. W. Haydon Co.)

For free copy circle No. 9 on postcard, p. 97

O_2 Analyzer

A data sheet outlines a self-contained O_2 test unit. This unit provides on-the-spot boiler and furnace test work to help improve combustion efficiency. Its many uses include checking for excessive stratification, verifying the effectiveness of permanently located sampling probes and contemplated new probe locations, and checking heater leakage. (Leeds & Northrup Co.)

For free copy circle No. 10 on postcard, p. 97

Cleaning Solution

Originally developed for aluminum, a non-etch soak cleaner also cleans brass, copper, zinc, lead and ferrous metals. It removes tars, pitch, drawing compounds. A data sheet describes it. (MacDermid, Inc.)

For free copy circle No. 11 on postcard, p. 97

Boring Spindles

Precision grinding and boring spindles are illustrated in an 8-page brochure. It shows many practical applications. (Ex-Cell-O Corp.)

For free copy circle No. 12 on postcard, p. 97

Plastics

Comparative properties of a large producer's polycarbonate resin and other thermoplastic molding materials are outlined in a chart. It shows that the new

Let KIRK and BLUM

bring your drawings to life

. . . on weldments and components

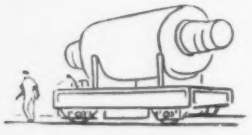
For 50 years, Kirk & Blum has served some of the nation's leading manufacturers . . . maintaining their confidence with substantial savings in time and cost. Whatever your fabrication, you can be sure Kirk & Blum will exercise the same care you demand of your own organization.

Kirk & Blum has complete facilities for fabrication of sheet metals, plate and structurals. Copper, aluminum, monel, stainless and other alloy fabrication is a K & B specialty.

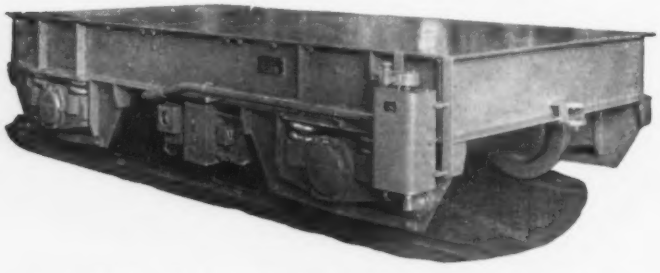
Let us send you details on products we have fabricated—or, send prints for prompt quotation.
Kirk & Blum Mfg. Co.,
3200 Forrer Street.,
Cincinnati 9, Ohio.

KIRK & BLUM

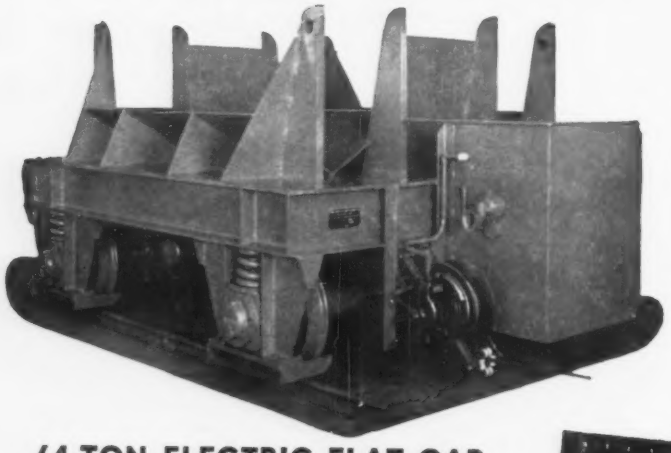
TRANSFER IT SAFELY
at Less Cost with
ATLAS



Atlas Safety-Type Transfer Cars are outstanding for moving heavy materials over short distances. Designed for storage battery, diesel or gas-electric, or cable reel service. Only one simplified control lever for safety. The car moves only when the operator holds the lever.



50-TON STORAGE BATTERY FLAT CAR



64-TON ELECTRIC FLAT CAR

Request "Walk-Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

FREE LITERATURE

polycarbonate plastic shows outstanding impact strength (12-16 ft lb/in on the Notched Izod test), and a heat distortion point of 280 to 290°F at 264 psi. Other test data listed include electrical and physical properties, as well as molding characteristics. (Chemical Development Dept., General Electric Co.)

For free copy circle No. 13 on postcard, p. 97

Copper Plating

A well-presented technical report analyzes characteristics of a new copper plating process. It tells how two special agents can be added directly to existing copper sulphate or copper fluoroborate baths. Result, it states, is smoother, more ductile deposits than previously possible. (Sel-Rex Corp.)

For free copy circle No. 14 on postcard, p. 97

Vacuum Pumps

High vacuum diffusion and booster diffusion pumps are the subject of a 12-page bulletin. Outline drawings, tables, and large scale speed curves present full physical and operating specifications for both mercury and oil pumps with speeds ranging from 10 to 11,000 cfm. (NRC Equipment Corp.)

For free copy circle No. 15 on postcard, p. 97

Cable Covering

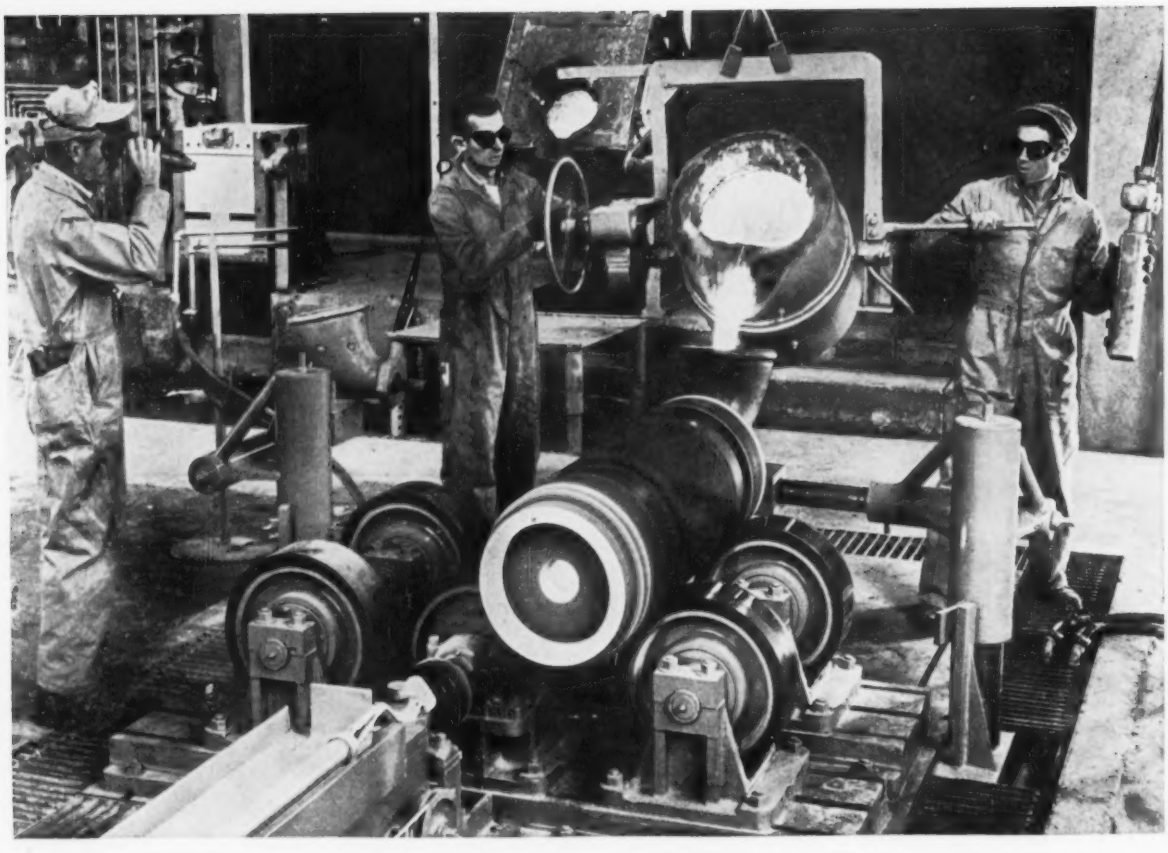
Fire hazards can be kept down by using a new cable-covering tape, says a 4-page brochure. It tells how the tape keeps strong in fire, water, acids and alkalies. Long-lasting, the material is silicone-impregnated asbestos. (Johns-Manville Corp.)

For free copy circle No. 16 on postcard, p. 97

Die Springs

Die springs are described in a 12-page catalog. It classifies them in 500 standard sizes. There's three distinct pressure groups for each size. (E. W. Bliss Co.)

For free copy circle No. 17 on postcard, p. 97



WHY GOOD CENTRIFUGAL CASTING DEMANDS INDUCTION MELTING

Though centrifugal casting has values apart from any melting furnace used, it achieves its ultimate performance only with induction melted metals. You may have wondered yourself why the vast majority of critical centrifugal castings are poured from Ajax-Northrup induction furnaces. The reasons are many—

Take purity for example. One major advantage of centrifugal casting is that the spinning concentrates impurities such as dirt, slag particles, even gas, at the internal skin, where they can be machined away easily. Obviously, the purer the melt, the thinner the skin to be machined. And Ajax-Northrup induction melting has proved itself many times over to be the purest melting method known!

Or take uniformity. The electromagnetic stirring action inherent in the Ajax-Northrup induction furnace assures absolute uniformity of chemical composition and temperature throughout the melt, resulting in consistently homogeneous castings, even with alloys containing metals of widely varying densities such as Al, Ni, and Mo. In fact, users have been able to eliminate uniformity tests on Ajax melted centrifugal castings entirely.

The precise metal temperature control available with Ajax-Northrup induction equipment is another important consideration in the production of consistently uniform castings. Hot and cold pours are eliminated. And this combination of ideal temperature control and perfect mixing adds up to good, reproducible results.

Ajax-Northrup induction melting equipment, with its unique control system offers you maximum melting efficiency with resulting lower melting costs. The new compact designs incorporate many features which minimize floor space requirements, drastically reduce installation costs, minimize maintenance, and provide simple, more efficient operation.

Induction heating & melting

AJAX

NORTHRUP

Whether you're centrifugal casting tiny investment castings, massive rolls, or critical jet engine tail sections, you're sure to find an Ajax furnace that satisfies your needs perfectly. We'll gladly send you further information, or, if you wish, arrange a meeting with qualified furnace engineers to discuss your special requirements. Ajax Electrothermic Corporation, Ajax Park, Trenton 5, New Jersey.

ASSOCIATED COMPANIES: AJAX ELECTRIC COMPANY-AJAX ENGINEERING CORPORATION

FORGED INSET

Flash Butt-Welded Into a Stainless Ring

SAVES MATERIAL, TIME, and MONEY

By welding a forging into a circled section of an extruded shape, American Welding saved one jet engine manufacturer over 200 lbs. of AMS-5613 stainless steel per ring. Hours of machining time were also eliminated. The finished ring met both government and prime contractor's specifications. Savings per ring were very substantial.

This is a typical example of how American Welding's experience in forming and welding of stainless, aluminum, titanium and heat-resistant alloys has helped others cut production costs — and may be able to help you.

If your problem is circular and of metal — call American Welding first.

NEW PRODUCTS CATALOG AVAILABLE

Write today for 20-page catalog illustrating the many types of circular products American Welding can form, weld and machine for you.

AMERICAN WELDING

THE AMERICAN WELDING & MANUFACTURING CO.
120 DIETZ ROAD • WARREN, OHIO

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Industrial Cars

Custom-built industrial cars and trailers are dealt with in an 8-page bulletin. It covers metal-wheeled and rubber-tired carriers using all types of running gear. Cars can be made to handle virtually any size and type equipment, material or product. (Easton Car & Construction Co.)

For free copy circle No. 18 on postcard

Turret Tap, Drill

An automatic indexing turret drill and tap machine is outlined in a data sheet. With a 3/16-in. capacity, this compact, space-saving unit has 12 speeds through its six-chuck turret head. (Burgmaster Corp.)

For free copy circle No. 19 on postcard

Pull Pin Fasteners

Single-action pull type pin fasteners are briefly described in a data sheet. These ball lock pins are ruggedly constructed, easy to insert or remove. (D. W. Price Corp.)

For free copy circle No. 20 on postcard

Presses

Hydraulic presses in 65, 125, 170 and 300-ton capacities are described in a 4-page brochure. And lower-capacity units can later be upped by using a special kit. Presses have hardened steel ways, adjustable bronze gibs with serrated bases. (A. Dale Herman, Inc.)

For free copy circle No. 21 on postcard

Stock Steel Items

An 8-page catalog describes many stock steel products used by the construction industries. A 1958 supplement to more-detailed individual publications, it covers stock-steel shell columns, concrete columns, shear heads, steel rigid frames, longspan joists, open web floorspan girders, vertical member trusses, pipe trusses, steel roof trusses, eggshell design steel plate roofs, vertical lift doors, scaffolding and turntables. (Shlagro Steel Products Corp.)

For free copy circle No. 22 on postcard

Chain Drives

One of the most comprehensive books ever written on silent chain drives contains 88-pages of detailed engineering data and illustrations of silent chain's versatility in a wide range of applications. It contains tables of service factors, ratings, chain length and center distance computations. (Link-Belt Co.)

For free copy circle No. 23 on postcard

Lift Trucks

Gasoline, LP-gas and diesel fork lift trucks are detailed in a 4-page folder. They all feature 4000-lb load-carrying capacities at a 24-in. load center. (Towmotor Corp.)

For free copy circle No. 24 on postcard

Quick-release Valves

Quick release valves are featured in a 6-page folder. Also covered is equipment for transmitting air, liquid or gases under pressure or vacuum from a stationary source into a rotating shaft. (Airflex Div., Fawick Corp.)

For free copy circle No. 25 on postcard

Comparator

Optical comparators are explained in a 36-page booklet. It tells how comparators precision-inspect and measure objects speedily and accurately. (Jones & Lamson Machine Co.)

For free copy circle No. 26 on postcard

Testing Lab Units

Testing machines for metallurgical laboratory use are detailed in an 8-page publication. It discusses

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 1/23 58

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

If you want more details on products advertised in this issue fill in below:

Page .....Product .....

Page .....Product .....

Page .....Product .....

PLEASE TYPE OR PRINT

Your Name .....

Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77

Village Station

NEW YORK 14, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
New York, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 1/23/58

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

If you want more details on products advertised in this issue fill in below:

Page .....Product .....
Page .....Product .....
Page .....Product .....

PLEASE TYPE OR PRINT

.....
Your Name

.....
Title

.....
Company

.....
Co. Address

.....
City Zone

.....
State

FREE LITERATURE

the workings of push-button controlled specimen mount presses. With controlled molding pressure, these units produce 1, 1¼, and 1½-in. mounts. They work with premolds or powder. (Buehler, Ltd.)

For free copy circle No. 27 on postcard

Stamping Presses

Two point, back gear, underdrive stamping presses are described in a company's reading matter. Presses come in four standard models; in 75, 100, 150 and 200-ton capacities. (Alpha Press & Machine, Inc.)

For free copy circle No. 28 on postcard

Trunnions

Indexing trunnions are featured in an 8-page catalog. It shows the speed and convenience of such trunnions in drilling, tapping and counterboring of a typical machine housing. (Johnson & Bassett, Inc.)

For free copy circle No. 29 on postcard

Screw Machine

A 6-page fold-out bulletin describes a new hand screw machine. This machine features a bed turret with six stations. The bulletin also explains how a standard 11-inch metal lathe may be converted into a hand screw machine. (Delta Power Tool Div., Rockwell Mfg. Co.)

For free copy circle No. 30 on postcard

Openhearth Equipment

Openhearth designers planning new facilities or modernization of existing shops are aimed at by a new bulletin. It contains data on steel plant equipment, including water cooled doors, frames, reversing valves, and dampers. (Blaw-Knox Co.)

For free copy circle No. 31 on postcard

Construction Material

A new idea in low profile building design is described in a slope beam roof system catalog. The 8-page catalog illustrates various applications of the new roof system, recommended for virtually every type of flat roof construction. (Steelcraft Mfg. Co.)

For free copy circle No. 32 on postcard

Magnetic O_2 System

A 4-page publication describes a magnetic O_2 system for flue gas analysis. (Leeds & Northrup Co.)

For free copy circle No. 33 on postcard

Presses

Straight side crankshaft presses are outlined in a 48-page catalog. It reviews: standard construction features, accessory equipment, press selection, specification tables, and special construction. (Clearing Machine Corp.)

For free copy circle No. 34 on postcard

Tank Weighing

Details of a new concept of tank weighing as a measurement of tank contents appear in a brochure. Covered in the bulletin is a hydraulic load cell which is the sensing device in a new weighing system. Combined with various instrumentation, the load cell provides indication, recording, printing or controlling of the contents of tanks. (The A. H. Emery Co.)

For free copy circle No. 35 on postcard

Flow Valve

Constant flow control valves are illustrated in a bulletin. It explains design, construction and performance characteristics of the diaphragm type, non-lubricated valves. Working pressure is 5000 lb. Flow rate is 45 gpm. (Kobe, Inc.)

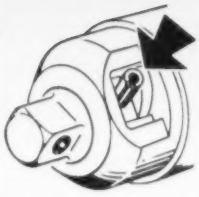
For free copy circle No. 36 on postcard

Electrolytic Grinding

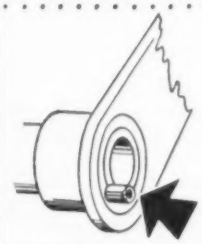
Latest electrolytic grinding applications appear in a 6-page folder. It describes major uses: (1) grinding extremely hard materials; (2) working temperature-sensitive materials; (3) grinding materials subject to burrs and layover when ground conventionally. (Anocut Engineering Co.)

For free copy circle No. 37 on postcard

Rollpin® replaces 12 different fasteners

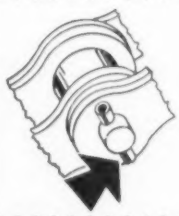


REPLACING A GROOVED PIN . . . in this application, Rollpin serves as a stop pin in a ratchet wrench adaptor. With its light weight and high shear strength, Rollpin functions perfectly . . . cuts assembly costs.



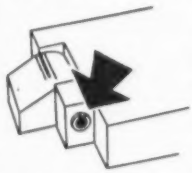
REPLACING A KEY . . . Rollpin demonstrates its ability to do away with precision tolerances, in this heating system damper arm. Faster, cheaper and more satisfactory than previous assemblies.

REPLACING A RIVET SHAFT . . . Rollpin serves as an axle for the sparkwheel of a cigarette lighter. No riveting or threading necessary . . . faster assembly. Note flush, clean fit.

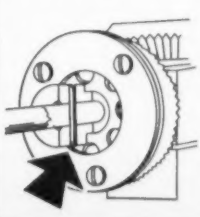


REPLACING A COTTER PIN . . . Rollpin assembly time is shorter, service life ten times longer. Vibration-proof flush fit. Easily removable.

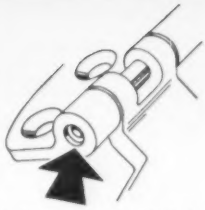
REPLACING A SET SCREW . . . to fasten automobile brake handle a short length Rollpin is self-retained in the hand grip but can easily be driven into over-drilled hole in shaft for simple handle removal.



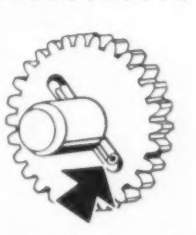
REPLACING A CLEVIS PIN . . . here Rollpin holds firmly in clevis, permits free action of moving member. Rollpin application shown is the plate of a home workshop tool.



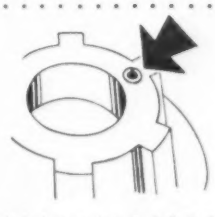
REPLACING TAPER PINS . . . in the assembly of precision differentials eliminated cost of taper pin reamers and the entire reaming operation. Rollpin costs less than a taper pin and installation is cheaper. They remove easily.



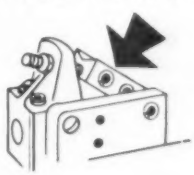
REPLACING A HEADED PIN . . . in this hinge pin application, Rollpin is simply and inexpensively driven in place, greatly reducing assembly costs. Constant spring tension holds Rollpin firmly in place . . . eliminates loosening of hinge due to wear.



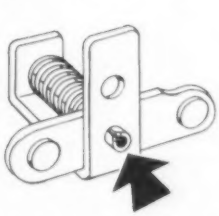
REPLACING A HUB ON A GEAR . . . Rollpin, self-retained in shaft, is simply snapped into molded slot to position sintered gear. This application, by an office equipment manufacturer, effects major savings in assembly. Rollpin's high shear strength is particularly valuable here.



REPLACING A DOWEL PIN . . . Rollpin is used here to prevent rotation of a thrust bearing. No reaming, no special locking. Easily removed. Lowest possible dowel pin cost.

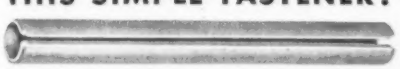


REPLACING A BOLT AND NUT . . . Rollpins act as fasteners and pivots for the linkages in this electric welder. Rollpins may be used with a free fit in outer or inner members depending upon product design requirements.



REPLACING A RIVET . . . Rollpin serves as guide shaft for spring-loaded electrical interlock contacts. This electrical equipment manufacturer reports that rivet failure previously occurred at the clinched end under normal operating impact and vibration.

WHERE CAN YOU USE THIS SIMPLE FASTENER?



Rollpin is the slotted tubular steel pin with chamfered ends that is cutting production and maintenance costs in every class of industry.

Drives easily into standard holes, compressing as driven. Spring action locks it in place—regardless of impact loading, stress reversals or severe vibration. Rollpin is readily removable and can be re-used in the same hole. Made in carbon steel, stainless steel and beryllium copper. Write for samples and information, ELASTIC STOP NUT CORPORATION OF AMERICA, 2330 Vauxhall Road, Dept. R47-177, Union, New Jersey

ROLLPIN TRADEMARK

ELASTIC STOP NUT CORPORATION OF AMERICA
2330 VAUXHALL ROAD, UNION, NEW JERSEY

Boring Bar Selection Vital To Precision

In precision boring, there are several methods of eliminating chatter, tapered holes and loss of size and profits.

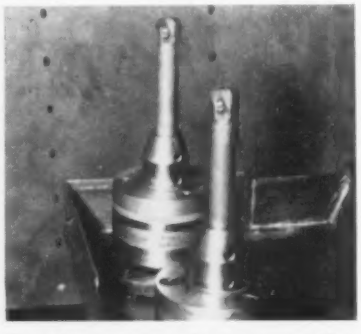
Choose tools carefully; they vitally affect accuracy, costs.

▪ Precision boring of small holes in metals long has caused troublesome problems. Machinists have tried many various means of eliminating chatter, tapered holes and loss of size. One of these, use of piloted boring bars, has become a common means of preventing deflection when straightening round holes or when the cutting tool would chatter.

For a typical boring operation of this type, machine operators generally use a bar with a 15/16-in. shank and a 4-in. pilot length of reduced diameter ahead of a 6¾-in. long shank. The pilot, sliding in a bushing in the machine, guides and steadies a small brazed or possibly solid carbide tool.

Solid Bars Useful—Solid carbide boring bars are now practical, in many cases they are economically advantageous. Their former excessive price has been reduced by both lower material and manufacturing costs. Thus they are now in a range in which their use often can be justified.

Costs have been cut further by Kennametal Inc., Latrobe, Pa., by development of a new carbide encased boring bar with throw-away carbide insert tools. Use of these boring bars makes piloted bars unnecessary in many boring operations, the firm says. This is because the carbide sleeve greatly increases stiffness of the bar. Many tests in the company's shops indicate that a core of soft material reduces chatter. In turn, this increases tool performance.



Carbide sleeve increases stiffness, soft core cuts chatter.

Reduces Vibration — Other tests tend to prove that bar chatter problems are practically eliminated by use of a boring bar with a Kennametal sleeve.

Significantly reduced costs of boring, which result when a stiffened and strengthened boring bar is used in machine shop operations, also increase the economic advantages of this type bar, the company states.

Faces Production Job—Tool development was given a boost by efforts to solve a production problem in boring 1-in. bolt holes in the connecting rods and caps for diesel engines. The necessary hole tolerances of +0.001, —0.000 in. were held originally with extreme difficulty. But the big worries were excessive tool breakage, boring bar wear, and replacement.

Tooling cost was reduced from 49 cents per piece to 8 cents per piece for the first 4423 pieces bored by the new type of carbide encased tool. This was demonstrated by a comparison test of a year's duration. The test was made on a Heald Boorematic machine. Boring bars which accounted for most of the 8-cent cost were good for many times this number of parts.

Cuts Tool Change Time — Tool

Clark Hole Mill

Clark Adjustable Spot-Facer & Counterbore

Efficient M-3 High Speed Steel
Clark HOLE-PRODUCING TOOLS
for production jobs on STAINLESS & ALLOY STEELS!

CLARK HOLE MILL—Makes fixed diameter holes fast! One pass in thick stock. Easy starts, curved or irregular surfaces. 1" to 4" sizes; others special.

CLARK ADJUSTABLE SPOT-FACER AND COUNTERBORE—One tool makes many diameters. Easily reground and reset. Heavy cuts in mills, drills, radials, turrets. 1" to 4" sizes; others special.

Write for information on all Clark HOLE-PRODUCING TOOLS!

Robert H. Clark Company
9330 Santa Monica Blvd., Beverly Hills, Calif.

ARMSTRONG *Drop Forged* **EYE BOLTS**
Drop forged from the best mild steel, heat treated to increased tensile strength and proof-tested to 50% beyond rated "safe working load." ARMSTRONG Eye Bolts are strong, dependable and safe. Blank or threaded, "Plain or Shoulder" patterns. 15 standard sizes and special lengths. Write for Catalog.
ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5209 ARMSTRONG AVE. CHICAGO 30, U.S.A.

Z I N C
STRIP AND WIRE
ZINC METALLIZING WIRE
ZINC ACCURATELY ROLLED
for electric fuse elements
THE PLATT BROS. & CO., WATERBURY 20, CONN.

change time was reduced by many hours. A Kendex insert repeats itself within 0.002 in. when indexed. By mounting these bars in an eccentric adjustable head with an adjustment range of approximately ±.012 in., it was possible to set a new cutting edge in seconds within any required tolerance.

Handlers Back Study

The need for trained materials handling personnel is growing rapidly. So states the College-Industry Committee on Material Handling Education. The organization, sponsored by The Material Handling Institute, Inc., and the American Material Handling Society, says this is due to increased recognition by top management that handling is an important factor in controlling manufacturing costs. "To achieve the utmost in industrial efficiency, materials handling merits the same study, training and research as have been given to safety, employee relations, power utilization, inventory control, etc," the group says.

Yields Big Ingots

Some 38-ft high, a commercially built vacuum arc melting furnace double-melts zirconium metal to yield 16-in. diam, 200-ton ingots. Presently operating at Carborundum Metals Co., Akron, N. Y., the consumable electrode furnace eliminates crucible contamination by melting the metal electrode in a water-cooled copper crucible. This prevents chemical reactions.

Many alloy steels are now being melted by this method because of the improved properties obtained, says Westinghouse Electric Corp., Pittsburgh, who built the unit. In addition to gas removal by vacuum action, the process exhibits a cleaning effect by floating impurities to the top of the ingot.

Cranes Weigh Less

Heavy-duty materials handling equipment is getting lighter in weight. Credit for this goes to the expanding use of aluminum. And the latest is the production of a number of 12-ton, 52-ft aluminum cranes. Being built by Northern Engineering Works, Detroit, for the Aluminum Co. of America, the cranes are of all welded construction. They're aluminum throughout, except for moving parts (i.e., gears, wheels).

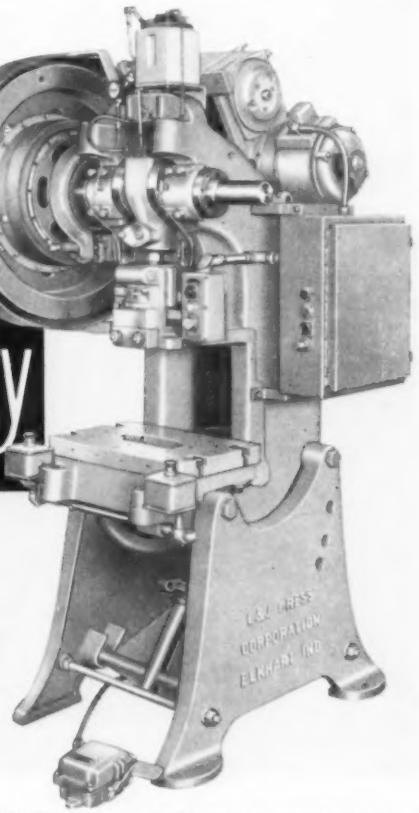
Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 97. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

L&J

Adaptability

MEANS MORE FOR YOUR MONEY



This makes sense—standard L&J Presses adapted for special jobs. With optional equipment these O.B.I. presses will often do the same work as special purpose machines—and with a much smaller investment. You'll still have the advantage of presses that can handle a greater variety of conventional jobs and with the right speed for each job. It will pay you to write for the facts.

OPTIONAL EQUIPMENT

Air Clutch. Left or right flywheel mounting. Variable speed drive. Automatic feed. Automatic misfeed stop. Accurate top stop. Push button or dial speed controls. Electric speed indicator. J.I.C. wiring. Automatic lubrication. Stroke length and shut height to fit the job. Bronze gibs. Ram counter balances, etc.

New

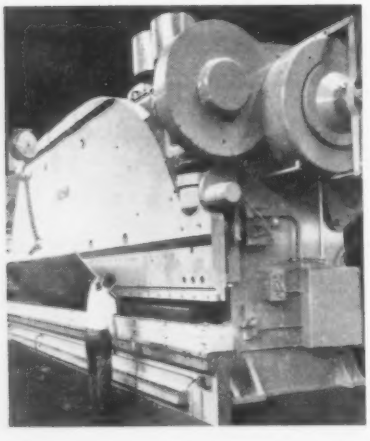
Write for new catalog of L&J Presses. Geared and non-geared models—14 to 90 ton capacities. Also, 20 to 150 ton Straight Side Punch Presses.

L&J PRESS CORPORATION

1623 STERLING AVENUE, ELKHART, INDIANA

New Production Ideas

Equipment, Methods and Services



Large Mechanical Press Brake Forms Aluminum

For forming and punching aluminum, this very large two-housing, mechanical-drive press brake boasts 30 ft 6 in. between housings. It features an over-all die surface of 34 ft. The stroke is 8 in. with a shut height of 23 in. Throat clearance of the press brake is 14 in. Four pneumatic counterbalances are provided to aid in returning the ram to the top of its stroke. Additional features of the unit include an air-electric clutch control, automatic overload press release, dual ram-adjusting motors, and two tonnage indicators. The press brake uses a two-speed transmission. This permits its operation at 5 or 20 strokes per minute. Approximate gross shipping weight of this unusually large machine is 354,000 lb. (The Cincinnati Shaper Co.)

For more data circle No. 38 on postcard, p. 97

Kit Helps Tool Designer on Boring Bar Jobs

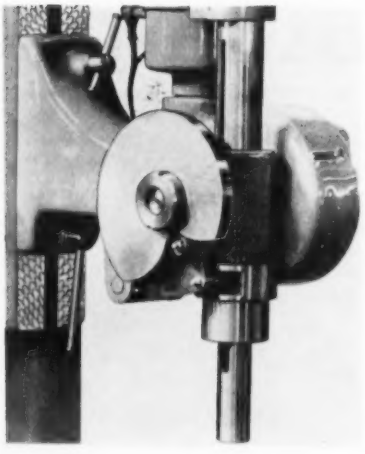
To supplement its design engineering service, a boring bar maker has available a simple, cost-cutting tool designer's layout kit. Comprised of actual size standard boring bar nose templates and cutting tool templates, the kit lets a tool engineer design, pre-price and order his own special two or three tool cluster boring bars from standard components. The kit makes possible use of any one of the maker's 330 standard boring bars to design special cluster tooling. Standard bars have a boring range of ½ to 7¼ in. These may be designed with either two or three more cutting tool units. In addition to providing the user with a simple cluster tool costing little more than a standard bar, the service also saves on delivery time. Taking standard bars from stock and converting them into specials takes just a matter of days. (Microbore Div., DeVlieg Machine Co.)

For more data circle No. 39 on postcard, p. 97

Mills Splines on Drill Press or Lathe

If you'd like to mill multiple splines or flutes in your shop and you haven't a milling machine available, just hook up this device to an ordinary drill press or engine lathe. It'll do the job. And it'll mill straight or spiral flutes, square or hexigon shapes. The unique, multiple cutter, high-speed production splining and fluting head is sturdy and compact. It's mounted on sealed, oiltight ball and roller bearings in a dirt and dust-proof casing. Featuring nickel chrome steel gearing, it mounts easily, operates easily, takes care of both standard and special milling requirements. Once set up, the tool is practically fool-proof; work spoilage is almost impossible even by unskilled users. It comes in taper shank models for drill presses, hollow spindle designs for long workpiece uses, sizes ½ to 5-in. diam. (Earle C. Boyer).

For more data circle No. 40 on postcard, p. 97



Cam Feed Fits Medium to Long Drilling Runs

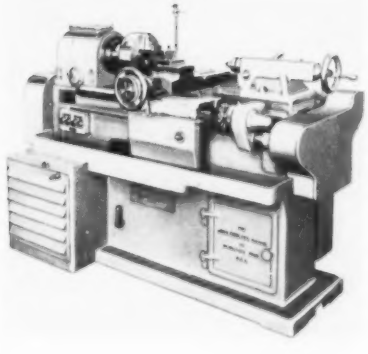
For medium to long production drilling runs, this cam feed controls the amount of travel up to 3 3/16 in., including rapid advance and feed. Externally mounted to the left side of the spindle siding arm, the cam feed's drive is supplied through a worm and worm gear. This assembly, in turn, receives its input power from a gear train in a gear case at the upper portion of the spindle. All gearing mounts on ball bearings and runs in an oil bath. The feed cycle can be started by a push button or foot switch. Feed is engaged or disengaged through an electric, direct current, magnetic clutch located in the worm shaft. A limit switch automatically stops the feed on cycle completion. Indexing devices or special fixturing provides electrical sequencing. The user can make cam changes in a few minutes. (Edlund Machinery Co.)

For more data circle No. 41 on postcard, p. 97

Automatic Control Speeds Drill Press Work

One drill press might do the work of five with a new control team. Designed to bring the sophistication of numerical control down to the simplicity of actual shop practice, the fully automatic table positioning system accommodates all sizes and patterns of drilling jobs, has drilling accuracy within 0.001 in. Ease of programming from shop drawings and elimination of non-productive machine time are other features. The control system consists of three separate units: a punched tape preparation unit, a tape reader and control unit, and a compound servo table. The system also adapts to any point-positioning setup: spot welding, riveting, engraving, tapping, countersinking. (Electronic Control Systems, Inc.)

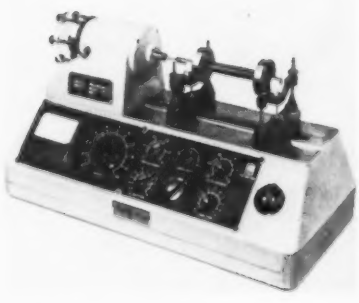
For more data circle No. 42 on postcard, p. 97



Threading Machine Features Automatic Cycling

This single point lathe produces threads at high speeds. An automatic cycling, mechanically operated machine tool, it produces internal threaded pieces up to 10-in. diam., external ones to 6-in. diam. Equipped with a 3-hp motor, it has 24-in. capacity between centers with a maximum swing over the cross slide of 6 in. Bed swing is 14 in. The maker's standard model (with a standard spindle) has infinite speed ranges between 250 to 1000, 150 to 600, or 125 to 490 rpm. Special speeds can also be provided by the manufacturer. It comes in both air and hand-operated types. Dimensions of the machine are: 80 x 36 x 52 in. (The James Coulter Machine Co.)

For more data circle No. 43 on postcard, p. 97



Balancing Machines Stress Quick, Easy Setup

Electro-dynamic balancing machines just announced handle production and short run balancing. These compact, static-dynamic horizontal balancing machines employ an electrical measuring system. This system is highly sensitive and easy to operate, says its maker. Both the angle and amount of unbalance are determined quickly by adjusting simple, electrical controls. A workpiece is rotated at speeds up to 3600 rpm by a direct motor drive using a universal joint. Speeds to 36,000 rpm are available with an auxiliary frequency convertor. (Tinius Olsen Testing Machine Co.)

For more data circle No. 44 on postcard, p. 97

No matter which *FINISH* you like—you can buy it in

MicroRold® QUALITY STAINLESS STEEL

2D—A silvery white, but non-lustrous, surface produced by annealing and pickling cold reduced material. Steel sheets & strip in this condition are most ductile and the surface holds lubricant well for severe drawing operations.

2B—Steel in the 2D condition which is subsequently rolled on a "skin pass" or temper mill. The surface acquires a bright finish from the polished rolls. This surface is somewhat more dense and hard than 2D and is a better starting surface for later finishing and buffing operations.

No. 3—This surface is made by grinding with a No. 100 abrasive. This surface is smooth but not as reflective as 2B.

No. 4—A finer finish than No. 3 made by grinding with a No. 150 abrasive. Like No. 3, this surface is easily blended with hand grinders after forming, drawing or welding.

No. 7—Good reflectivity and brilliance made by polishing with a No. 400 abrasive. This semi-mirror finish must be protected during fabrication by adhesive paper or strippable plastics lest the finish be marred beyond repair.

BRIGHT—A highly reflective surface made by cold reducing with highly polished, glass-hard rolls. This finish is only available in Type 430 stainless.

These are our standard surface finishes that are available in types 201, 202, 301, 302, 304 and 430 except Bright which is type 430 exclusively.

These finishes are regularly supplied in sheet and coil form in widths up to 48 inches.

Since Nos. 3, 4, 7 and 430 Bright are smooth reflective surfaces, they are not recommended for severe drawing without special precautions as the mill finish may be marred. Applications such as dairy machinery, kitchen and restaurant equipment and architectural decorative work require only local forming, so these highly polished surfaces are not greatly disturbed. All mill polished sheets are carefully packed to avoid handling imperfections. Protective adhesive paper can be specified by the buyer when needed.

For specific information on recommended surface characteristics for a particular stainless steel sheet and strip application, address your request to our Product Development Dept.

Washington Steel *Corporation*

Producers of Stainless Sheet and Strip Exclusively

12-L WOODLAND AVENUE, WASHINGTON, PA.

The Iron Age Summary

Order Shifting Confuses Picture

Shifting and re-shifting of orders is called excessive by some steel people.

Schedules are getting out of hand and uneconomical. Mills go far afield for sales. There are some plus factors in the market.

■ Some major steel users are scraping the bottom of the barrel on their steel inventories this week and are forcing mills to play leap-frog with their orders.

They are demanding immediate shipment of steel that had been scheduled for later delivery and generally shifting orders ahead or back to fit their own day-to-day production schedules.

May Be Excessive — Some of these rush orders are for tonnages that could better be handled by warehouses. Shifting has reached the point in many cases where it is excessive for the small tonnage involved, but salesmen are pressuring production departments to shift and re-shift.

The result is that schedules are getting hectic and uneconomical in some mills. Each week, the number of consumers working directly from freight cars or trucks is growing.

Some Hope—Demands on producers are so severe that a mill can lose orders of a thousand tons or more for as little as a single day's difference in delivery promises.

Despite this, the steel sales fraternity sees a faint ray of hope this week. This is unusual in a group that has been pessimistic for months. Signs are not strong enough to predict a general upswing at this time. It is merely an indication that the low point may have been reached.

Plus Factors—These reasons are cited for optimism: (1) automotive has been buying very close to the vest, usually needs more steel in the spring; (2) the seasonal construction pickup is in sight; (3) roadbuilding will be a bigger factor than last year; and (4) defense spending will have an effect, if only psychological.

The severe drop in steel demand has intensified competition within the industry. This has resulted in these recent marketing developments as mills scramble for available business.

Top steel executives are now taking a personal hand in sales, attempting to gain a greater percentage of individual consumers' steel requirements for their mills.

Reaching Out—Mills are reaching far out of their normal market areas to pick up possible orders.

Leapfrogging of orders has confused the market picture, which can change over night. Less than six days ago, February appeared to be shaping up as one of the worst months in years. But some shifting of March orders into February gives the month a somewhat better appearance this week.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 1,500	Last Week 1,538	Month Ago 1,382	Year Ago 2,484
Ingot Index (1947-1949=100)	93.4	95.7	86.0	154.6
Operating Rates				
Chicago	55.5	58.0*	65.0	98.0
Pittsburgh	55.0	54.0*	48.0	99.0
Philadelphia	60.0	62.0	45.0	103.0
Valley	45.0	47.0*	34.0	97.0
West	66.0	72.0*	70.0	99.0
Buffalo	54.0	54.0	61.0	105.0
Cleveland	51.0	49.5*	55.0	94.5
Detroit	51.0	55.0	40.0	105.0
S. Ohio River	58.5	64.0*	57.5	88.0
South	56.0	58.0	71.0	98.0
Upper Ohio R.	58.5	58.0*	58.0	105.0
St. Louis	69.0	67.0*	51.5	98.0
Northeast	31.0	31.0	31.0	31.0
Aggregate		57.0	54.0	97.0

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.622
Pig Iron (Gross ton)	$66.42	$66.42	$66.42	$62.90
Scrap, No. 1 hvy (Gross ton)	$34.33	$33.17	$32.00	$57.83
No. 2 bundles	$26.17	$25.33*	$24.00	$46.17
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	27.00	27.00	27.00	36.00
Lead, St. Louis	12.80	12.80	12.80	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin Straits, N. Y.	91.63	93.50	92.50	101.75
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

Pump Prices Should Hold Steady

Pump manufacturers are wasting little time thinking about price increases.

They're concentrating on developing and selling new or improved products.

▪ Prospect of a tough competitive year ahead has toned down plans that pumpmakers may have had for price increases.

One medium-size producer of centrifugal pumps anticipates a 6 pct price increase in May "unless the current trend of business makes such a move impossible."

A large Midwestern company expects to make some price additions of about 3 to 5 pct. Other pumpmakers are contemplating minor price adjustments but, by and large, most of the industry is content to go along with prices that were established six months or a year ago.

No Material Shortages—There are other conditions that favor the customer. The problems of 1955, 1956, and early 1957 have disappeared. There are no delays in delivery because of material shortages. Unless you require a pump made of some special grades of nickel alloy, you can expect quick service.

There is no waiting for stock items. Parts that are standard but not stock require a delay of from two to 10 weeks.

BALANCE CHECK: The one rotating part in a Chempump, the rotor impeller combination, is carefully checked for static and dynamic balance. Chempump Corp., Philadelphia, specializes in stainless steel canned pumps.

Sales Optimism — Most pumpmakers are cautiously optimistic about the 1958 market picture. "We expect sales to hold steady" is the most often heard prediction. At one extreme is an eastern firm that says:

"Sales are declining somewhat, but not seriously. We expect a quiet first half with an improvement during the second half."

At the other extreme is a New England company that is looking for a 15 pct increase in sales during 1958. It's relying on plans laid last year to bear fruit. The plans involve changes in marketing channels, sales organization, and discount structure. Last year, this company reviewed its product line and pruned 48 of 161 items. But even this company admits it is expecting a "hard sell business climate."

What They Feature — Many pumpmakers are placing their chips on new and improved products to help them through the year—plus the aggressiveness of their sales organizations.

Here are some of the new products they will be pushing:

A complete line of horizontal end-suction process pumps introduced by Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles.

A new BA type high-speed slurry pump and a vertical type RXB submerged slurry pump — Morris Machine Works, Baldwinsville, N. Y.

A water-lubricated submersible turbine pump and a special turbine pump for irrigation—Fairbanks, Morse & Co., Chicago.

Type HHM horizontal split case, two-stage, centrifugal pump line, by American-Marsh Pumps, Inc., Battle Creek, Mich.

Editorial Reprints from

The IRON AGE

The following reprints of articles featured in past issues of The IRON AGE are available to our readers. Many of these articles have already received wide acclaim and should prove valuable to any business or personal library. Orders filled as long as supplies last by PROMOTION DEPT., The IRON AGE, Chestnut & 56th Streets, Philadelphia 39, Penna. If less than $10.00, kindly remit with order.

How to Weld Mild Steel

Nine coated electrode specifications cover just about every requirement for manual arc welding mild steel. How to select electrodes for various positions and types of work.

six pages 15¢

Steel Ingot Capacities

Official steel ingot capacities as of Jan. 1, 1957, by Iron Age districts. Capacities by companies and by types. Also pig iron and coke capacities by companies.

six pages 25¢

Inspection and Quality Control

To cut costs, take a close look at your inspection and in-plant scrap control systems. Special survey report shows how many companies handle this important job.

eight pages 15¢

How to Figure Executive Pay

Here is industry's latest thinking on how to pay executives to cut down turnover, attract good management men. A survey report shows pay of top management, middle management, going prices for engineers and other executives. What companies are doing about pension and bonus plans.

eight pages 15¢

How to Beat the Heat

Survey replies from more than 1000 metalworking plant managers throughout the country give you a broad and detailed basis for attacking your hot weather problems. Gives you another tool to improve labor relations, cut down-time, and boost efficiency.

eight pages 15¢

How to Pick Executives

Results of a two-year study of executive selection answer such questions as: "How are executive jobs filled?" "What checks are made before final selection?" "What experience is the most valuable?"

eight pages 15¢

Metalworking's Growing Markets

Includes a five page article by Director, Bureau of the Census, on U. S. population trends. . . . The steel outlook 1957-1961. . . . Aluminum—supply, shipments, market trends. Copper—major markets, international aspects, copper mine capacity. Tips on selling to the government—still America's number one customer. How the government can help you find new markets.

thirty-two pages 25¢

HOW TO GET MORE FOR YOUR METALWORKING DOLLAR

Thousands of cost conscious readers have written in for copies of articles in this prize winning series.

More For Your Aluminum Dollar

Properties, designations, alloy selection, heat treatment, forgings, castings, melting practice. Charts on mechanical properties. Also tips on machining, blanking, forming, welding, brazing, etc.

sixteen pages 25¢

More For Your Carbon Steel Dollar

Part I: Purchasing: Drawing quality, surface finish and chemistry extras . . . plain carbon vs. alloy . . . working tolerances . . . heat treatment. Part II: Processing: Inspection, quality control, plating, carburizing, nitriding, hardening, normalizing and annealing.

sixteen pages 25¢

More For Your Stainless Steel Dollar

Part I: Purchasing: Properties, types, surface finishes, corrosion resistance, chemical extras, alloy selection and heat treatment. Part II: Processing: turning, milling, welding and brazing, heat treatment, grinding, polishing and drilling.

sixteen pages 25¢

Metal Cleaning and Finishing Handbook

Contains twenty-three pages of tables ranging from spot test identification of metal surfaces through surface treating, plating, rust preventives, government specifications, specification plating, electroplating baths, cleaning and pickling, etc. Also a six-page article on plating including product design, drag-out, water supply, waste disposal, etc.

thirty-two pages 50¢

More For Your Material Handling Dollar

Cost cutting ideas for handling materials, parts and finished goods. Includes: The overall approach, analysis of plant problems, industrial trucks, conveyors, palletizing, loading and unloading devices.

sixteen pages 25¢

More For Your Stamping Dollar

Basic design rules. How flat blanks cut tooling costs. How to make holes the right way. Hints on better bending. Design for drawn parts. How to emboss and curl. How to save on stock. How ribs and beads save weight. Tips on tolerances, etc.

sixteen pages 25¢

More For Your Organic Finishing Dollar

Pointers on painting, how to rate primers. Hints on storing and handling paints. Ways to get better finishes at less cost. Cleaning and preparing steel before finishing (a 2-page table). How quality control pays off.

sixteen pages 25¢

More For Your Machining Dollar

Tips on machining stainless steel: turning, drilling, milling, tapping, threading, broaching and reaming. Cutting speeds and feeds for standard tools on standard carbon steels.

sixteen pages 25¢

STEEL PRODUCT MARKETS

User Stock Policies Change Selling

Nimble footwork is needed in market where every salesman wants to move his product, but nobody wants to stock it.

Wave of first quarter cancellations continues in linepipe.

▪ The inventory game of tag — move the product, but avoid stocking it—is keeping steel buyers and sellers on their toes. As a result some new ideas in selling are turning up.

Here are two of them:

Tube and casing manufacturers are trying to reduce inventories by putting steel into the hands of their regular distributors on easy credit terms.

Wire product producers, expecting a rush on welded wire fabric when the spring construction season begins, are urging buyers to take delivery now. Because of the bulkiness of the product and the wide variety of sizes produced, mill stockpiling of the item is difficult.

Chain Reaction—The inventory merry-go-round is rough for both producers and consumers. Suppliers of steel stampings, for example, continue getting periodic rush orders from the automakers. Stampers, who aren't in a position to carry steel or finished parts in inventory very long, must rush to the mills and ask for fast shipment.

Linepipe Collapse — A recent court decision challenging the ratemaking powers of the FPC has temporarily knocked the props out from under the linepipe market. The resulting deferment of pipeline projects has left big gaps in mill order books for large diameter welded pipe. Some producers are now offering February delivery. So far, over 500,000 tons of pipe, almost one-eighth of last year's total production, has been stripped from first half schedules. There are orders still on the books dating into 1961 but nobody wants early shipment on them. Basic demand for linepipe is still strong, however, and the market is expected to rebound.

Steel Capacity — The nation's steelmaking capacity (see table) is now 140.7 million net ingot tons, an increase of 7.3 million tons. Last year, with a capacity of 133.4 million tons, U. S. producers turned out 112.7 million ingot tons.

Sheet and Strip—Some automotive buyers are taking practically no sheet for February. The low ebb in steel buying by auto firms will make the month a poor one for the mills. However, the producers hope the sharp adjustment by customers will pave the way for a March pickup. Most current activity in the automotive sheet market centers around deferments.

Plate and Shapes—With sheared mill plate readily available users are gearing orders closely to actual needs. Many customers are placing orders with a request for shipment in two weeks. The growing lag in linepipe demand is biting into plate sales. Best current customers for plate and structurals are the shipyards and the fabricators. Steel mills are counting on some improvement in the market when building and highway construction spurts in the spring. However, right now tank fabricators, car builders and construction equipment manufacturers are all cutting plate inventories. **West Coast** buyers, with more larger size structurals coming in from the **East,** are switching to products in the over-10-in. category. The local mills, which specialize in the smaller structurals, are feeling the pinch.

Bar—User pressure on the mills for delivery is making things hectic for both hot-rolled and cold finished suppliers. Mills report that the difference of only a single day in delivery promises can make or break the chances of landing a 1000 ton order. Under the circumstances rolling schedules are losing their significance. One **Eastern** mill man calls them "lists of what we'd like to roll if we got the orders." Auto buyers are reducing their tonnages for February. Orders from the implement makers are fair. Brightest spot for mills at the moment are orders from some railroad car builders. Bar fabricators in the **Farwest** are cutting inventories and letting the mills worry about meeting delivery schedules.

How Steelmaking Capacity Grew in '57

	Jan. 1, 1958	Jan. 1, 1957	Increase or Decrease
Steel Ingots and Castings (net tons)			
Open Hearth	122,321,830	116,912,410	+5,409,420
Bessemer	4,027,000	4,505,000	−478,000
Oxygen	1,081,000	540,000	+541,000
Electric and Crucible	13,312,740	11,501,740	+1,811,000
Total Steel	140,742,570	133,459,150	+7,283,420
Blast Furnace Capacity	91,000,110	86,817,950	+4,182,160

(Source: American Iron and Steel Institute)

COMPARISON OF PRICES

(Effective Jan. 21, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**: declines appear in *Italics*.

	Jan. 21 1958	Jan. 14 1958	Dec. 17 1957	Jan. 22 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	50.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.95
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.65
Special coated mfg. ternes	9.55	9.55	9.55	9.20
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	43.25
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.075
Light rails	6.50	6.50	6.50	6.00
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.622¢

	Jan. 21 1958	Jan. 14 1958	Dec. 17 1957	Jan. 22 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.51	$70.51	$70.51	$66.88
Foundry, Valley	66.50	66.50	66.50	63.00
Foundry, Southern Cin'ti	71.65	71.65	71.65	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	63.00
Basic, del'd Philadelphia	70.01	70.01	70.01	66.38
Basic, Valley furnace	66.00	66.00	66.00	62.50
Malleable, Chicago	66.50	66.50	66.50	63.00
Malleable, Valley	66.50	66.50	66.50	63.00
Ferromanganese, 74-76 pct Mn, cents per lb†	12.25	12.25	12.25	12.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.42	$66.42	$66.42	$62.90
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$32.50	$32.50	$32.50	$59.50
No. 1 steel, Phila. area	38.00	36.50	33.00	58.50
No. 1 steel, Chicago	32.50	30.50	30.50	55.50
No. 1 bundles, Detroit	22.50	21.50	21.50	49.50
Low phos., Youngstown	35.50	35.50	33.50	65.50
No. 1 mach'y cast, Pittsburgh	49.50	49.50	50.50	60.50
No. 1 mach'y cast, Philadel'a	47.50	47.50	50.50	60.50
No. 1 mach'y cast, Chicago	47.50	45.50	40.50	54.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$34.33	$33.17	$32.00	$57.83
No. 2 bundles	26.17	25.33*	24.00	46.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$15.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$18-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	25.00	25.00	27.00	36.00
Copper, Lake, Conn.	25.00	25.00	27.00	36.00
Tin, Straits, N. Y.	91.625‡	93.50	93.625	101.75
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	12.80	12.80	12.80	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

INDEX TO PRICE PAGES

Prices At a Glance	105
Comparison of Prices	109
Bars	118
Billets, Blooms and Slabs	116
Boiler Tubes	120
Bolts, Nuts, Rivets, Screws	121
Clad Steel	120
Coke	120
Electrical Sheets	120
Electrodes	120
Electroplating Supplies	121
Ferroalloys	123
Iron Ore	120
Merchant wire products	120
Metal Powders	121
Nonferrous	
Mill products	115
Primary prices	105-114-115
Remelted metals	115
Scrap	115
Pig Iron	122
Pipe and Tubing	119
Plates	118
Rails	120
Refractories	120
Shapes	116
Sheets	117
Spring Steel	120
Stainless	122
Steel Scrap	110
Strip	116
Structurals	116
Tinplate	117
Tool Steel	120
Track Supplies	120
Warehouse Prices	121
Water Pipe Index	121
Wire	118
Wire Rod	117

Hendrick Manufacturing Company, pioneer perforator, can really help designers improve product appearance and salability SOLD? No matter what the material you're using... be it metal, masonite, rubber, plastic, or insulated board, Hendrick's wide experience and manufacturing facilities can be of real help. You can select from hundreds of attractive designs in commercially rolled metals and gauges in round, square, diamond, hexagonal, or slotted, square, round, perforation in plain or Panel effects.

Hendrick MANUFACTURING COMPANY

37 Dundaff Street, Carbondale, Pa.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring—Shur-Site Treads • Armorgrids • Hydro Dehazers • Petrochemical Column Internals

New Orders Bring Higher Prices

Mills coming into the market had to go above former price levels to get scrap.

No sudden strengthening is expected, but new purchases will probably bring moderate price increases.

■ For weeks, most of the trade held to the theory that any representative buy would have to bring higher than quoted prices.

This theory proved out in several markets this week, with a few scattered purchases raising prices for some grades from $1 to $3.

Most significant movement was in Chicago, where a number of smaller mills bought, raising prices $2. Major mills were still slow in buying and the price rise indicated more a scarcity of scrap than a strengthening market.

The same type of action occurred in Philadelphia, where a mill buy raised the price of No. 1 heavy melting $1.50. Here again the market is not strong, but prices had dropped to an unrealistic level.

These purchases indicate the action to be expected in the next few weeks. There is no strong demand and, for the most part, mills are able to get by on small purchases at comparatively low prices. But where price declines have overshot the realistic level where scrap will move, upward movement will occur.

The purchases in Philadelphia and Chicago brought the No. 1 Heavy Melting Composite Price up to $34.33 from last week's level of $33.17.

The Pittsburgh market did not move, but a firmer tone existed.

Pittsburgh—The market has a firmer tone as yards show more interest in buying. There's an increased resistance to current selling prices, although there have been no price changes. Mill demand continues so slight they are able to buy the small tonnages they need at prevailing prices. One mill has paid from $32 to $34 for small quantities of industrial bundles. The current price on No. 2 bundles is still $29.

Chicago—A wave of purchases by smaller mills, coupled with continued purchasing by foundries, has boosted prices by about $2. Major mills in the area are still slow in buying. Current upward break in prices seems more closely tied to scrap scarcity, rather than business activity. Dealer stocks continue low. There are unconfirmed reports of consumer purchases of factory bundles at $38, No. 2 bundles at $25, and punchings and plate at $46.

Philadelphia—An area mill was willing to pay $38.50 for No. 1 heavy melting, an increase of $1.50 over last week's price. The mill had to settle for the higher price to draw sufficient tonnage from this scrap-scarce market. Export continues to drain most of the openhearth grades.

New York—Prices remain unchanged, with export business continuing to provide some floor on the market, especially for steelmaking grades. There's little hope for a real pickup in the market before the second quarter. However, there's agreement that new orders will boost prices when they finally come in.

Detroit—Dealers are reluctant to part with scrap at prevailing prices. One mill paid considerably more than the quoted price for an order of No. 2 bundles, raising the price on the grade by $3. Other steel grades are also up $1-$2 on appraisal. Turnings and cast grades remain unchanged.

Cleveland—With mills insisting on prompt delivery, some tonnage is being charged directly off incoming cars to cut mill yard handling charges. Dealers are optimistic.

St. Louis—Scrap movement is low, supplies are scarce and prices unchanged. A few token orders are the extent of buying by district mills. Foundries are in the market for short rail, causing advances of $1 in rail random length and $2 in rail, 18 inch and under.

Birmingham — A local mill bought No. 2 heavy melting at an increase of $2 over previous levels. The grade is now $26 to $27. Brokers, who have been having trouble filling orders on this grade, believe the supply situation will now improve.

Cincinnati—Mills and dealers are at a sales deadlock with the brokers caught in the middle. The mills aren't too eager for the scrap and will not go over the current prices. Dealers, on the other hand, are still holding out for higher prices.

Buffalo—Market is very quiet with no price changes. Heavy snow has halted flow of scrap to dealer yards. Also discouraging was the shutdown of a blast furnace at one mill.

Boston — Prices remained unchanged in a very quiet market. Business was at a virtual standstill with neither domestic nor export activity.

West Coast—Market shows no signs of a pickup with the mills taking only limited tonnages. Some foundries in the area are working only three or four days a week. Export continues slow.

Number **ONE**
Specialist in
Stainless
Steel
Scrap

KLAFF

FIRST *in*
Experience
and Service!

H. KLAFF & CO., INC.
Ostend & Ridgely Sts.
Baltimore 30, Md.
LExington 9-6721

SCRAP PRICES *(Effective Jan. 21, 1958)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	32.00 to 33.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and ms. turn.	16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. punch'gs plate	36.00 to 37.00
Heavy turnings	31.00 to 32.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	54.00 to 55.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
RR couplers and knuckles	45.00 to 46.00
No. 1 machinery cast.	49.00 to 50.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00

Chicago

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	36.00 to 37.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	30.00 to 32.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. forge crops	48.00 to 49.00
Low phos. punch'gs plate	44.00 to 45.00
Low phos. 3 ft and under	42.00 to 43.00
No. 1 RR hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	46.00 to 47.00
Rerolling rails	52.00 to 53.00
Rails 2 ft and under	55.00 to 56.00
Locomotive tires cut	47.00 to 48.00
Cut bolsters & side frames	44.00 to 45.00
Angles and splice bars	49.00 to 50.00
RR steel car axles	51.00 to 52.00
RR couplers and knuckles	46.00 to 47.00
No. 1 machinery cast.	47.00 to 48.00
Cupola cast.	41.00 to 42.00
Heavy breakable cast.	39.00 to 40.00
Cast iron brake shoe	39.00 to 40.00
Cast iron wheels	38.00 to 39.00
Malleable	52.00 to 53.00
Stove plate	39.00 to 40.00
Steel car wheels	47.00 to 48.00

Philadelphia Area

No. 1 hvy. melting	$37.50 to $38.50
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	37.50 to 38.50
No. 2 bundles	26.00 to 27.00
No. 1 busheling	37.50 to 38.50
Machine shop turn.	20.00 to 21.00
Mixed bor. short turn.	21.00 to 22.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	39.00 to 40.00
Low phos. 2 ft and under	40.00 to 41.00
Low phos. punch'gs	40.00 to 41.00
Elec. furnace bundles	37.50 to 38.50
Heavy turnings	30.00 to 31.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
Rails 18 in. and under	58.00 to 60.00
Cupola cast.	36.00 to 38.00
Heavy breakable cast.	39.00 to 40.00
Cast iron car wheels	40.00 to 41.00
Malleable	55.00 to 56.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast.	47.00 to 48.00

Cleveland

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	28.00 to 29.00
No. 1 factory bundles	31.00 to 32.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	28.00 to 29.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Cut struct'r'l & plates, 2 ft & under	36.00 to 37.00
Drop forge flashings	28.00 to 29.00
Low phos. punch'gs, plate	29.00 to 30.00
Foundry steel, 2 ft & under	33.00 to 34.00
No. 1 RR heavy melting	34.00 to 35.00
Rails 2 ft and under	54.00 to 55.00
Rails 18 in. and under	55.00 to 56.00
Railroad grate bars	15.00 to 16.00
Steel axle turnings	16.00 to 17.00
Railroad cast.	46.00 to 47.00
No. 1 machinery cast.	45.00 to 46.00
Stove plate	42.00 to 43.00
Malleable	57.00 to 58.00

Youngstown

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. plate	35.00 to 36.00

Buffalo

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	25.50 to 26.50
No. 1 busheling	28.00 to 29.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	22.50 to 23.50
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Low phos. plate	34.00 to 35.00
Scrap rails, random lgth.	40.00 to 41.00
Rails 2 ft and under	50.00 to 51.00
RR steel wheels	37.00 to 38.00
RR spring steel	33.00 to 34.00
RR couplers and knucklers	33.00 to 34.00
No. 1 machinery cast.	40.00 to 41.00
No. 1 cupola cast.	34.00 to 35.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$22.00 to $23.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 dealer bundles	22.00 to 23.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	21.00 to 22.00
Drop forge flashings	19.00 to 20.00
Machine shop turn.	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	9.00 to 10.00
Cast iron borings	9.00 to 10.00
Low phos. punch'gs plate	19.00 to 20.00
No. 1 cupola cast.	27.00 to 28.00
Heavy breakable cast.	22.00 to 23.00
Stove plate	22.00 to 23.00
Automotive cast.	30.00 to 31.00

St. Louis

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	14.00 to 15.00
Cast iron borings	16.00 to 17.00
Shoveling turnings	17.00 to 18.00
No. 1 RR hvy. melting	34.00 to 35.00
Rails, random lengths	41.00 to 42.00
Rails, 18 in. and under	48.00 to 49.00
Angles and splice bars	40.00 to 41.00
Std. steel car axles	43.00 to 44.00
RR specialties	42.00 to 43.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	32.00 to 33.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	37.00 to 38.00
Cast iron car wheels	32.00 to 33.00
Rerolling rails	46.00 to 47.00
Unstripped motor blocks	32.00 to 33.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$23.00 to $24.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	22.00 to 23.00
Elec. furnace, 3 ft & under	29.00 to 30.00
Machine shop turn.	8.50 to 9.50
Mixed bor. and short turn.	9.50 to 10.50
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	16.00 to 17.00
No. 1 machinery cast.	32.00 to 33.00
Mixed cupola cast.	27.00 to 28.00
Heavy breakable cast.	25.00 to 26.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	26.00 to 27.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	17.00 to 18.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	23.00 to 24.00
No. 1 machinery cast.	34.00 to 35.00
Mixed yard cast.	29.00 to 30.00
Charging box cast.	30.00 to 31.00
Heavy breakable cast.	30.00 to 31.00
Unstripped motor blocks	27.00 to 28.00

Birmingham

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	36.00 to 37.00
Elec. furnace, 3 ft & under	35.00 to 36.00
Bar crops and plate	39.00 to 40.00
Structural and plate, 2 ft	39.00 to 40.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rails, random lgth.	41.00 to 42.00
Rails, 18 in. and under	48.00 to 49.00
Angles & splice bars	42.00 to 43.00
Rerolling rails	48.00 to 49.00
No. 1 cupola cast.	49.00 to 50.00
Stove plate	48.00 to 49.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	36.00 to 37.00
Unstripped motor blocks	39.00 to 40.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	23.50 to 24.50
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	15.00 to 16.00
Low phos., 18 in. and under	37.00 to 38.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	53.00 to 54.00
No. 1 cupola cast.	35.00 to 37.00
Hvy. breakable cast.	33.00 to 34.00
Drop broken cast.	47.00 to 48.00

San Francisco

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast.	42.00

Los Angeles

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	20.00
Machine shop turn.	9.00
Shoveling turnings	11.00
Cast iron borings	11.00
Elec. furn. 1 ft and under (foundry)	43.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast	38.00

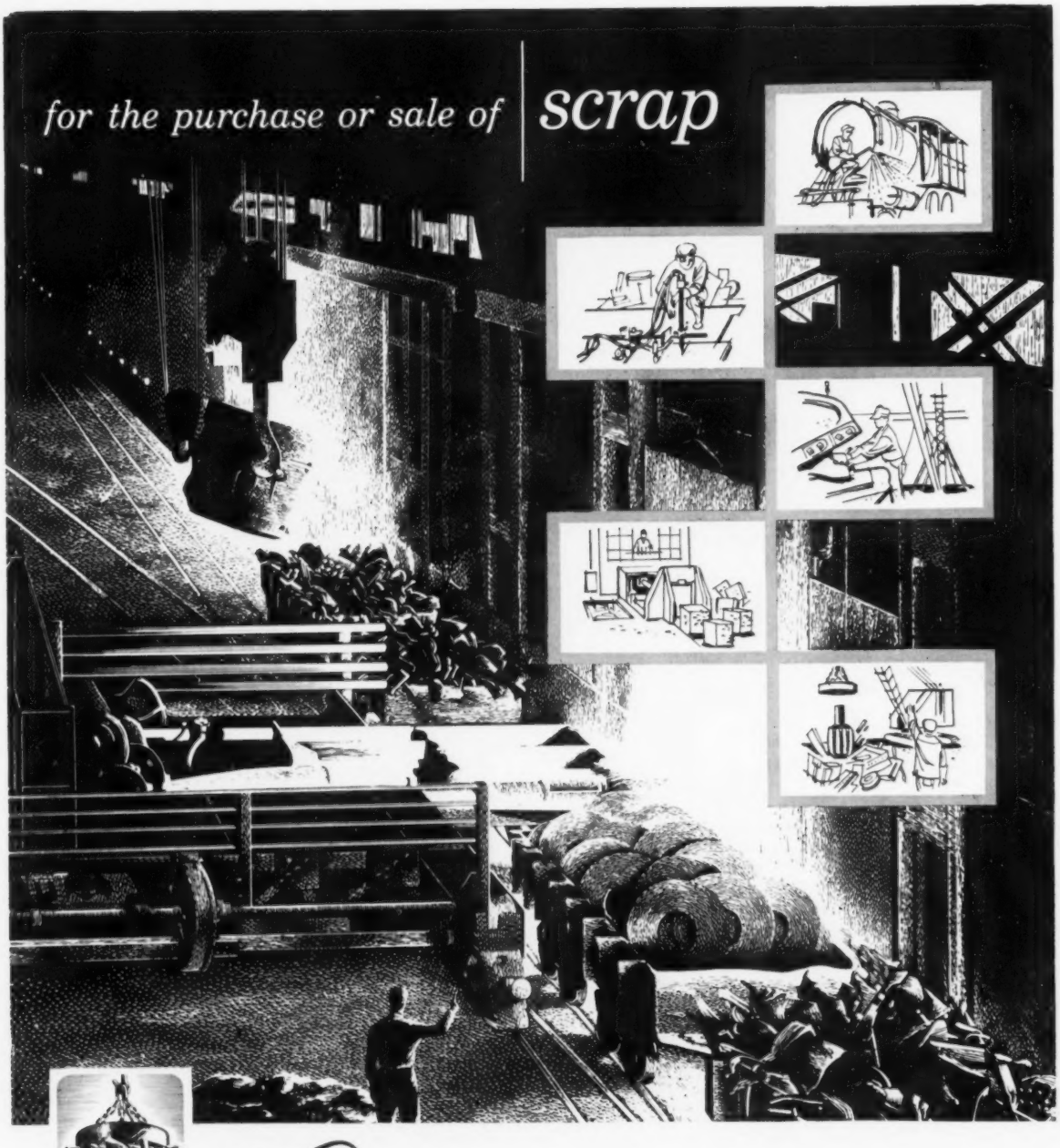
Seattle

No. 1 hvy. melting	$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	24.00
No. 1 cupola cast	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	27.00
No. 1 dealer bundles	32.00
No. 2 bundles	22.00
Mixed steel scrap	27.00
Busheling	22.00
Bush., new fact, prep'd	32.00
Bush., new fact, unprep'd	26.00
Machine shop turn.	17.00
Short steel turn.	21.00
Mixed bor. and turn.	17.00
Rails, rerolling	41.00
Cast scrap	$44.00 to 47.00

for the purchase or sale of **scrap**



Luria Brothers and Company, Inc.

main office **PHILADELPHIA NATIONAL BANK BUILDING,** *Phila. 7, Pa.*

PLANTS

LEBANON, PENNA. DETROIT (ECORSE), READING, PENNA. MICHIGAN
MODENA, PENNA. PITTSBURGH, PENNA.
ERIE, PENNA.

OFFICES

BIRMINGHAM, ALA. CLEVELAND, OHIO LOS ANGELES, CAL. PUEBLO, COLORADO
BOSTON, MASS. DETROIT, MICHIGAN MEMPHIS, TENN. READING, PENNA.
BUFFALO, N. Y. HOUSTON, TEXAS NEW YORK, N. Y. ST. LOUIS, MISSOURI
CHICAGO, ILLINOIS KOKOMO, INDIANA PITTSBURGH, PENNA. SAN FRANCISCO, CAL.
CINCINNATI, OHIO LEBANON, PENNA. PHILADELPHIA, PA. SEATTLE, WASH.
In Canada MONTREAL, QUEBEC—HAMILTON, ONTARIO

IMPORT & EXPORT — **LIVINGSTON & SOUTHARD, INC.,** 99 Park Ave., New York, N. Y. • *Cable Address:* **FORENTRACO**

Aluminum Producers Adjust Output

In recent weeks there have been both aluminum expansions and cutbacks.

The market is still off, but some new capacity is still being brought in.

■ Aluminum producers are trying to adjust their output in the face of a sagging market that shows no immediate signs of recovery. It's not easy.

Most producers committed themselves to major expansion projects in 1955, when metal was scarce. Most of these new facilities are just finished or approaching completion. But the added capacity is not always desirable.

Firm Contracts—In some cases no-option contracts to supply metal and buy power make production mandatory. But when this is not the case, caution is the watchword.

Despite the current soft market, the producers are optimistic about the future. They are sure that eventually all the new facilities now being built or planned will be needed. On the short range, some forecasters are saying business might take a sharp turn for the better later in 1958. Aluminum producers might need more production in a hurry.

Here's what has happened and why:

Alcoa Cutback—Aluminum Co. of America pulled the plug on four of its potlines — three at Alcoa, Tenn., and one at Pt. Comfort, Tex. This should cut the company's production by about 10 pct from 1957. Alcoa said the move was made because of the current lag in demand. But these lines can be very easily and rapidly put back into operation if aluminum buying picks up.

Alcoa also halted construction of its new Evansville, Ind., smelter, a new line and an alumina plant at Pt. Comfort. The company has no immediate need of any of these facilities now. All are three-fourths finished and could be completed in a few months.

Reynolds' New Line—Reynolds Metals tapped the first of three new potlines at a new plant at Listerhill, Ala. The other two will be in by spring or early summer. Reynolds says work on the new Massena, N. Y., smelter is proceeding on schedule.

Both of these plants have contracts to deliver a large part of their output as hot metal to auto companies. In addition, Reynolds had to battle long and hard to get Seaway power for its Massena plant. If it reneged now its future power supply would be threatened.

At Ravenswood—Kaiser Aluminum has closed down two lines at Mead, Wash. The company would have had to use expensive steam power to keep these lines running. It tapped its new Ravenswood, W. Va., plant late last year, and by now is turning out quantities of commercial aluminum. Kaiser is hoping the location in the heart of aluminum's biggest market area will help sell the metal.

Aluminium Ltd. delayed expanding Kitimat any further. However, the company has the power at Kitimat to handle any future expansion, and is going full speed ahead with a major power project at Chute-des-Passes in eastern Canada.

Tin

After several months of relative clarity, the tin market waters are getting muddied again. The price is still bouncing around in a 90¢ to 93¢ range, with no consistent buying.

But, some large traders in New York and London are looking to the International Tin Council meeting this week with apprehension. They say the group is approaching a crisis that will take drastic action to overcome.

Bankroll Getting Thin — The buffer stock has been supporting the market by buying up large quantities of tin. Most traders believe it contains no less than 18,000 long tons of tin, with very little cash to buy more.

The ITA also cut exports by 28½ pct in an attempt to bolster the market. The result has been the same as the buffer buying; it has helped prevent the market from dropping sharply, but hasn't bolstered it. Consensus is that producers won't hold still for another severe export cut.

Tin prices for the week: Jan. 15 —92.50; Jan. 16—91.75; Jan. 17 —91.00; Jan. 20—91.625; Jan. 21 —91.625.*

* Estimate.

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum pig	26.00	25.00	8 1 57
Aluminum ingot	28.10	27.10	8 1 57
Copper (E)	25.00	27.00	1 13 58
Copper (CS)	24.50	25.00	1 13 58
Copper (L)	25.00	27.00	1 13 58
Lead, St. L.	12.80	13.30	12 2 57
Lead, N. Y.	13.00	13.50	12 2 57
Magnesium ingot	36.00	34.09	8 13 56
Magnesium pig	35.25	33.75	8 13 56
Nickel	74.00	64.50	12 6 56
Titanium sponge	165 250	165 225	5 5 57
Zinc, E. St. L.	10.00	10.50	7 1 57
Zinc, N. Y.	10.50	11.00	7 1 57

ALUMINUM: 98% ingot frt allwd. **COPPER**: (E) = electrolytic, (CS) = custom smelters, electrolytic, (L) = lake. **LEAD**: common grade. **MAGNESIUM**: 99.8% pig, Velasco, Tex. **NICKEL**: Port Colbourne, Canada. **ZINC**: prime western. **TIN**: see above; other primary prices, pg. 115.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate
("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3"
1100, 3003	46.6	44.3	43.6	42.7
5052	54.0	48.9	47.2	45.4
6061-0	51.4	47.0	45.2	45.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6–8	45.0-46.8	60.4-64.1
12–14	45.7-47.2	61.3-65.8
24–26	49.0-49.5	72.1-76.8
36–38	58.0-58.6	96.2-99.8

Screw Machine Stock—2011-T-3

Size"	¼	⅝-⅞	¾-1	1¼-1½
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated
(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.420	$1.893	$2.367	$2.839
.024 gage	1.774	2.366	2.957	3.549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250-3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	108.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

Factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	48.13		45.36	48.32
Brass, 70/30	42.69	43.23	42.63	45.60
Brass, Low	44.90	45.44	44.84	47.71
Brass, R.L.	45.67	46.21	45.61	48.48
Brass, Naval	47.07		41.38	50.48
Muntz Metal	45.19		41.00	
Comm. Bz.	46.98	47.52	46.92	49.54
Mang. Bz.	50.81		44.91	
Phos. Bz. 5%	67.17		67.67	

Free Cutting Brass Rod 31.03

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy, $10.00; Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.55
Calcium, 99.9%, small lots ..... $ 4.55
Chromium, 99.8% metallic basis ... $ 1.31
Cobalt, 97-99% (per lb) .... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 53.50
Gold, U. S. Treas, per troy oz. $35.00
Indium, 99.9%, dollars per troy oz... $ 2.25
Iridium, dollars per troy oz..... $80 to $90
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $220 to $225
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz... $19 to $21
Platinum, dollars per troy oz... $77 to $80
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 89.875
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 26.25
No. 120 ..... 25.25
No. 123 ..... 24.50
80-10-10 ingot
No. 395 ..... 30.25
No. 315 ..... 28.25
88-10-2 ingot
No. 210 ..... 37.25
No. 215 ..... 33.00
No. 245 ..... 29.75
Yellow ingot
No. 405 ..... 21.75
Manganese bronze
No. 421 ..... 23.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 25.75-26.50
0.60 copper max. 25.50-26.25
Piston alloys (No. 122 type) .. 24.25-25.00
No. 12 alum. (No. 2 grade) ... 22.00-23.00
108 alloy 22.25-23.50
195 alloy 25.25-26.75
13 alloy (0.60 copper max.) .. 25.50-26.25
AXS-679 ..... 22.25-23.50

(Effective Jan. 20, 1958)

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 23.00-24.00
Grade 2—92-95% 21.75-22.50
Grade 3—90-92% 20.50-21.50
Grade 4—85-90% 18.25-19.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	21	20¼
Yellow brass	16⅛	14½
Red brass	18⅝	17⅞
Comm. bronze	19¼	18½
Mang. bronze	14⅞	14⅛
Yellow brass rod ends	15⅞	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 19¾
No. 2 copper wire 18⅛
Light copper 16
•Refinery brass 17¾
Copper bearing material 17¼
•Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 19¾
No. 2 copper wire 18¼
Light copper 16
No. 1 composition 18¼
No. 1 comp. turnings 17⅝
Hvy. yellow brass solids ... 13
Brass pipe 14½
Radiators 14¼

Aluminum

Mixed old cast. ..... 13 —13½
Mixed new clips ..... 15½—16
Mixed turnings, dry ..... 14 —14½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 17½—18
No. 2 copper wire ..... 15½—16
Light copper ..... 13½—14
Auto radiators (unsweated) .. 11¾—12
No. 1 composition ..... 15 —15½
No. 1 composition turnings ... 14 —14½
Cocks and faucets ..... 12 —12½
Clean heavy yellow brass ... 12 —12¼
Brass pipe ..... 12 —12⅛
New soft brass clippings .... 12½—13
No. 1 brass rod turnings .... 10½—11

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 10 —10½
1100 (2S) aluminum clippings 13 —13½
Old sheet and utensils ..... 10 —10½
Borings and turnings ..... 6½— 7
Industrial castings ..... 10 —10½
2024 (24S) clippings ..... 11½—12

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1½— 1⅝

Nickel and Monel

Pure nickel clippings 42-45
Clean nickel turnings 37-40
Nickel anodes 42-45
Nickel rod ends 42-45
New Monel clippings 28-29
Clean Monel turnings 20-23
Old sheet Monel 25-26
Nickel silver clippings, mixed. 18
Nickel silver turnings, mixed. 15

Lead

Soft scrap lead ..... 8½— 9
Battery plates (dry) ..... 3½— 3⅝
Batteries, acid free ..... 2½— 2⅝

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 11 —11½
Solder joints ..... 14½—15
Siphon tops 42
Small foundry type ..... 12 —12¼
Monotype ..... 12 —12¼
Lino. and stereotype ..... 11 —11¼
Electrotype ..... 10 —10¼
Hand picked type shells ..... 7 — 7½
Lino. and stereo. dross ..... 3 — 3¼
Electro dross ..... 2½— 2⅝

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.			$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8,P13*	7.75 *U1,Y1 W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8 M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R5*					5.025 *G3, M2*	7.25 *M2,D1, D2,G3,P11*	7.425 *G3*	10.60 *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.275 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4, S2*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.225 *W3*	5.275 *W3*			4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.675 *K1*	9.00 *K1*				
	Geneva Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective Jan. 20, 1958)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.			Coke* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*			6.15 *W6*			
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*				$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*		6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.										6.45 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*									
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*										
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*				6.15 *A5, R3,W8, N4, K2*			
	Sterling, Ill.										6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*			6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*						
	Newport, Ky	4.925 *A1*	6.05 *A1*											
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3,Y1*	6.05 *U1, I3,Y1*	6.60 *U1, I3*	6.625 *U1, I3,Y1*	7.00 *U1*	7.275 *U1, Y1,I3*	8.975 *U1, Y1*			6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1,Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*								$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*							6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*								
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3,S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1,R3*	7.275 *R3*	8.975 *S1, R3*					$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3,P6*	6.05 *U1, J3,P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*		6.15 *A5, J3,P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*								6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3,W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*				$10.05 *W3, W5*	$8.75 *W3, W5*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*			6.15 *Y1*			
WEST	Fontana Cal.	5.675 *K1*	7.30 *K1*				8.025 *K1*	10.275 *K1*				$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*												
	Kansas City, Mo.										6.40 *S2*			
	Los Angeles, Torrance, Cal.										6.95 *B2*			
	Minnequa, Colo.										6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*							6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*							6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.										6.40 *S2*			

† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.
* COKES: 1.50-lb. add 25¢.
ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.

(Effective Jan. 20, 1958)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *W6*
	Claymont, Del.							5.10 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.10 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.			7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland, Newport, Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,I3*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio Elyria, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13 C18*		8.775 *A5, C13, C18*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.55 *P3* 7.50 *P8,B5*	6.475 *R5* 6.575 *G3*	8.775 *R5* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A3*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind.											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.175 *J5* 6.125 *K1*	6.175 *J5* 6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.65 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7 C6*
	Seattle Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16,S11*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.45 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B5*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B5*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9c to 11c per lb. East St. Louis. For each 2c change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13c to 15c would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7c to 9c would increase discounts. East St. Louis zinc price now 10c per lb.

(Effective Jan. 20, 1958)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
1.5	4	1.5	8	—	1.155	M-1
6	4	2	6	—	1.545	M-3
6	4	2	5	—	1.30	M-2
High-carbon chromium					.925	D-3, D-5
Oil hardened manganese					.475	O-2
Special carbon					.36	W-1
Extra carbon					.36	W-1
Regular carbon					.305	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4, C4*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302				37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	.....
	410	29.55	33.10	36.70	.....
	430	29.80	33.55	37.25	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	$.525	6.50	6.975				
Cleveland *R3*							14.75
So. Chicago *R3*				9.75			
Ensley *T2*	$.525	6.50					
Fairfield *T2*		6.50		9.75		6.60	
Gary *U1*	$.525					6.60	
Huntington *C16*		6.50					
Ind. Harbor *I3*	$.525		6.975	9.75		6.60	
Ind. Harbor *Y1*				9.75			
Johnstown *B3*		6.50					
Joliet *U1*			6.975				
Kansas City *S2*				9.75			14.75
Lackawanna *B3*	$.525	6.50	6.975			6.60	
Lebanon *B3*			6.975		14.50		14.75
Minnequa *C6*	$.525	7.00	6.975	9.75		6.60	14.75
Pittsburgh *P5*							14.75
Pittsburgh *J3*				9.75			
Seattle *B2*				10.25		6.75	15.75
Steelton *B3*	$.525		6.975			6.60	
Struthers *Y1*				9.75			
Torrance *C7*						6.75	
Williamsport *S5*		6.50					
Youngstown *R3*				9.75			

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field		9.625	
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Special Motor		12.10	
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 66	20 20
Trans. 52	17.10	Trans. 80	19.20
		Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	15.00

(Effective Jan. 20, 1958)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢ lb.	Merch. Wire Galv. ¢ lb.
Alabama City *R3*	173	187		212	193	8.65	9.20
Aliquippa *J1***	173	190			190	8.65	9.325
Atlanta *A8***	175	192		214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*						8.65	8.95*
Chicago *N4****	173	190	172	212	196	8.65	9.325
Cleveland *A6*						8.65	
Cleveland *A5*							
Crawf'dsv. *M4***	175	192		214	198	8.75	9.425
Donora, Pa. *A5*	173	187		212	193	8.65	9.20
Duluth *A5*	173	187		212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187		212	193	8.65	9.20
Galveston *D4*	9.10‡						
Houston *S2*	178	192		217	198	8.90	9.45
Jacksonville *M4*	184 ‡	197		219	203	9.00	9.675
Johnstown *B3***	173	190	172		196**	8.65	9.325**
Joliet, Ill. *A5*	173	187		212	193	8.65	9.20
Kokomo *C9**	175	189		214	195*	8.75	9.30*
L. Angeles *B2****						9.60	10.275
Kansas City *S2**	178	192		217	198*	8.90	9.45*
Minnequa *C6*‡	178	192	177	217	198‡	8.90	9.45‡
Monessen *P6*					193	8.65	9.20
Palmer, Mass. *W6*						8.95	9.50*
Pittsburg, Cal. *C7*	192	210			213	9.60	10.15
Rankin, Pa. *A5*	173	187			193	8.65	9.20
So. Chicago *R3*	173	187			193	8.65	9.20
S. San Fran. *C6*‡				236		9.60	10.15‡
SparrowsPt. *B3***	175			214	198	8.75	9.425
Sterling, Ill. *N4****	175	192	172	214	198	8.75	9.425
Struthers, O. *Y1**						8.65	9.30
Worcester *A5*	179					8.95	9.50
Williamsport *S5*							

* Zinc less than .10¢.
** 11-12¢ zinc.
*** 10¢ zinc.
‡ Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.50	10.40	12.60	15.60	18.55
Bristol, Conn. *W12*		10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70		
Detroit *D1*	9.05	10.50	12.70	15.70	
Detroit *D2*	9.05	10.50	12.70		
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60		
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*			12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*		10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	
	2½	12	48.94	57.31	
	3	12	56.51	66.18	
	3½	11	65.97	77.25	
	4	10	87.61	102.59	

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½

(Add 25 pct for broken case or keg quantities)

Finished

⅞ in. and smaller 63

Rivets

	Base per 100 lb
½ in. and larger	$12.25
	Pct. Off List
7/16 in. and smaller	19

Cap Screws

	Discount (Packages)
	Full Finished H. C. Heat Treat
New std. hex head, packaged	
⅝" diam. and smaller x 6" and shorter	40 — 26
¾", ⅞", and 1" diam. x 6" and shorter	22 — 3
⅝" diam. and smaller x longer than 6"	8 — +13
¾", ⅞", and 1" diam. x longer than 6"	+ 6 — +32
	C-1018 Steel Full-Finished Cartons Bulk
¼" through ⅝" dia. x 6" and shorter	58 — 49
¾" through 1" dia. x 6" and shorter	45 — 33

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Stove Bolts
Cartons	19	32
Bulk — *Quantity*		
To ¼" diam. incl. — 25,000-200,000	9	54
5/16 to ½" diam. incl. — 25,000-200,000	9	54
All diam. over 3" long — 5,000-100,000	—	54

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
In Bulk — *Quantity*		
⅜" diam. & smaller — 15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955. value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	42.00
Electrodeposited	33.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots	16.50
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.55
Tin, ball anodes $1.13 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	71.70
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	24.05
(Philadelphia price 24.50)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, freight allowed west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	10.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	27.0¢
Carbonyl iron size 3 to 20 micron, 98%, 98.8+% Fe	88.0¢ to $2.85
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	31.1¢ to 47.1¢
Copper, electrolytic	41.50¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd	$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed -80	$1.13
Silicon	43.50¢
Solder powder	13¢ plus met. value
Stainless steel, 302	$1.02
Stainless steel, 316	$1.30
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh) $3.75 (nominal)	
Zinc, 5000 lb & over	17.5¢ to 30.7¢

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68	.....	.....	.....	.....
Baltimore	$.10	8.38	8.98	9.71	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57	.....	.....	.....	.....
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.15	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.20	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.10	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.44	18.96
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65	.....	.....	.....	17.60
Detroit	.15	8.58	9.85	10.50	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		8.45	9.75	.....	8.60	9.05	8.60	8.55	11.10	16.20	.....	19.30	19.05
Kansas City	.20	9.02	10.27	10.07	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	7.85**	10.85	11.75	7.90	7.90	7.95	7.90	13.35*	17.05	16.10	21.05	20.35
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12.11*	.....	.....	.....	.....
Milwaukee	.15	8.48	9.73	10.28	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Norfolk	.20	8.00	.....	.....	8.40	8.35	8.70	8.45	10.70	.....	.....	.....	.....
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.50	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland		8.50	11.20	11.55	9.05	8.30†	8.65	8.65	14.50	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.00	10.00	9.70	9.80	10.80	14.05	16.55	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20	.....	17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.51	8.74	9.08	9.25	9.12	9.56	15.66	15.16	19.01	18.96
St. Paul	.15	8.94	10.19	10.76	8.99	9.45	9.53	9.37	9.81	.....	15.26	.....	19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** All sizes except 18 and 16 gage.

†† 10¢ zinc. ‡ Deduct for country delivery. † 3/16 in. to ½ in. * C1018—1 in. rounds.

(Effective Jan. 20, 1958)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	
Birmingham *R3*	62.00	62.50*			
Birmingham *W9*	62.00	62.50*	66.50		
Birmingham *U4*	62.00	62.50*	66.50		
Buffalo *R3*	66.00	66.50	67.00	67.50	
Buffalo *H1*	66.00	66.50	67.00	67.50	
Buffalo *W6*	66.00	66.50	67.00	67.50	
Chester *P2*	66.50	67.00	67.50		
Chicago *I4*	66.00	66.50	66.50	67.00	
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50		
Fontana *K1*	75.00	75.50			
Geneva, Utah *C7*	66.00	66.50			
Granite City *G2*	67.90	68.40	68.90		
Hubbard *Y1*			66.50		
Ironton, Utah *C7*	66.00	66.50			
Midland *C11*	66.00				
Minnequa *C6*	68.00	68.50	69.00		
Monessen *P6*	66.00				
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*		66.50	67.00	67.50	
Sharpsville *S4*	66.00	66.50	66.50	67.00	
So. Chicago *R3*	66.00	66.50	66.50	67.00	
So. Chicago *W8*	66.00		66.50	67.00	
Swedeland *A2*	68.00	68.50	69.00	69.50	
Toledo *I4*	66.00	66.50	66.50	67.00	
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*			66.50	67.00	

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50-52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*, Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *J3*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U5* (plus further conversion extras); *W1*; New Bedford, Mass. (.25¢ per lb higher), *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*, Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R3*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa. *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R3*; Munhall, Pa., S. Chicago, *U1*.

(Effective Jan. 20, 1958)

SUPERSALESMAN

100 years' experience . . . has excellent contacts with 97% of the buying power in the metalworking industry. Will make over 185,000 calls every week.

The IRON AGE Chestnut and 56th Streets Philadelphia 39, Penna.

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C	41.00	0.50% C	38.00
0.05% C	39.00	1.00% C	37.75
0.10% C	38.50	1.50% C	37.50
0.20% C	38.25	2.00% C	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.50
0.025% C (Simplex) 36.75
8.00% max C, 50-55% Cr, 3-6% max Si 25.00
8.50% max C, 50-55% Cr, 3% max Si 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Ca, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed, pallets	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	14.20	75% Si	16.40
65% Si	15.25	85% Si	18.10
	90% Si	19.50	

Ferrovanadium

50-55% V delivered, per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

(Effective Jan. 20, 1958)

Aisifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots	$4.90
Less ton lots	4.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.60 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 ..... $1.38

Zirconium, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	27.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload	$5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots, F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight, allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

RAILWAY EQUIPMENT FOR SALE

Used - As Is - Reconditioned

RAILWAY CARS

All Types

SERVICE-TESTED

FREIGHT CAR REPAIR PARTS

For All Types of Cars

LOCOMOTIVES

Diesel, Steam, Gasoline
Diesel-Electric

SPECIAL

STANDARD GAUGE CARS

COVERED HOPPER CARS

10—70 Ton Capacity

ORE HOPPER CARS

660 Cubic Feet
40- and 50-Ton Capacity

SIDE DUMP CARS

5—Air-operated, 30-Cubic Yard, Drop Door, Austin-Western

RAILWAY TANK CARS and STORAGE TANKS

6,000- 8,000- and 10,000-Gallon
Cleaned and Tested

CRANES

Overhead and Locomotive

IRON & STEEL PRODUCTS, Inc.

General Office
13496 S. Brainard Ave.
Chicago 33, Illinois
Phone: Mitchell 6-1212

New York Office
50-B Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

"ANYTHING containing IRON or STEEL"

Sales Remain Slow At Pittsburgh

Used machinery business there is quiet in most lines with sales and inquiries down.

There's little strength for toolroom items, fabricating machinery, electrical motors and handling equipment.

▪ Pittsburgh machinery dealers find no pickup in sales and no great rush of inquiries. The lag in steel operations has played a big part in the slowdown. Other industries have felt the slump or fear it will hit them.

One steel mill supplier is buying straighteners, levelers and other finishing auxiliaries. "I don't know why," says a company spokesman. "There are no sales and no prospects."

Toolroom Sales Slow—A supplier of toolroom equipment says inquires have improved but sales are still slow. Plants are only buying when they have specific jobs lined up. In some cases, companies are putting off purchases even when they need equipment for work at hand. There is a general hesitation with everyone waiting to see what happens next.

Supply lines have loosened a little. "I'm afraid to make anyone an offer today," says one dealer. "They take you up too fast." Another says there has been some improvement; a few late-model production machines are appearing; but good toolroom equipment remains scarce.

Fabricating Also — A similar situation is reported by a supplier of fabricating equipment. A few late models are appearing but there is no abundance of good equipment. Users of bending rolls, shears and other types of fabricating machinery are doing a lot of shopping. They are very price conscious and are slow to move but have indicated the need for a broad range of equipment.

A dealer in materials handling equipment is still "living on hopes." Inquiries are holding up fairly well and there are occasional sales of small trucks but business generally is down.

Electrical equipment is still in the slump that started abruptly at the end of last summer. After a booming first half, business went into a tailspin. The slump continued through the fourth quarter and this year has seen no improvement.

Prices Are Important—Dealers are getting a few inquires for motors and motor-generator sets but no product class is showing real strength. The supply of electrical equipment has improved but with customer needs so skimpy, it is not easy to come up with the right unit.

Steel Is The Key—However, the basic problem for dealers is the general business slump. With so much Pittsburgh business depending on steel and with area steel mills operating about 50 pct of capacity, the district has been particularly hard hit.

Apart from direct cutbacks, the steel slump has generated widespread pessimism and caution. If the situation should become stabilized, even at a low level, some of this sluggishness should disappear. A definite pickup would bring action on the orders that are now being pushed back.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
10' x 10" Ga. Bertsch Initial Type
10' x ½" King Pyramid Type
18' x 1" Niles Pyramid Type

BRAKE—PRESS TYPE
10' x ¼" & 12' x ¼" Hydraulic—NEW

BUILDING
120' x 420' New Steel Frame—Unerected

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span	220/3/60
5 ton Cleveland	69' Span	110 Volt D.C.
5 ton Shepard Niles	70' Span	230 Volt D.C.
8 ton P&H	55' Span	220/3/60
10 ton Shepard Niles	38' Span	440/3/60
10 ton Shaw	48' Span	230 Volt D.C.
10 ton Shaw	120' Span	230 Volt D.C.
15 ton Shepard Niles	52' Span	230 Volt D.C.
20 ton Shaw	28' Span	230 Volt D.C.
50 ton Northern	52' Span	440/3/25 A.C.
120 ton P&H	66' Span	220/3/60 A.C.
120 ton Shepard Niles	77' Span	220/3/60

CRANE GIRDERS
10 ton Capacity 77' 2" Span—No Motors

DRAW BENCHES
8,000# Waterbury Farrel Single Draw 20 Ft. Length of Draw
10,000# Aetna Standard Single Draw 44 Ft. Length of Draw

FORGING MACHINES
1" to 5" Acme, Ajax, National

FURNACE—MELTING
15 ton Heroult Top Charge, 12' Shell Complete with Transformers

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING
800 lb. to 12,000 lb. incl.

HEADERS
#250C Manville Solid Die Single Stroke
#44 Waterbury Farrel DSOD Capy. ⅝" x 6"

LEVELLERS—ROLLER
37" Torrington, 19 Rolls 1 31/32", dia.
72" Budd-McKay Flex & Roller Leveller 15 Rolls 4½" Dia.

PLANERS
36" x 36" x 10' Cincinnati
48" x 48" x 16' Niles-Bement-Pond
72" x 72" x 16' Detrick & Harvey Four Head

PRESSES—HYDRAULIC
500 ton HPM Fastraverse, Bed 36" x 36"
600 ton Elmes, 36" Stroke, 48 x 45" Bet. Cols.
1500 ton Bliss 15" Stroke, Bed 49" x 48"
1500 ton Mesta Steam Hydr. Forging Press
4800 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESS—KNUCKLE JOINT
600 ton Bliss No. 25, 2½" Stroke, Bed 24 x 29"

PRESSES—STRAIGHT SIDE
180 ton Hamilton #847, 12" Str. 85½" Bet. Ups.
200 ton Clearing F1200-42, Stroke 30", Bed 44"x38"
250 ton Bliss SI 7½ Str. Blstr. 33" x 39"

PUNCH & SHEAR COMBINATIONS
Cleveland Style EF, Arch Jaw Capy. 1¼" x 1"
Cleveland Style G Single End, 60" Throat
Cleveland Style W, 60" Throat, Architectural Jaw

ROLLING MILLS
6" x 5" Torrington Wire Flattening Mill Line
8" x 10" Schmitz Single Stand Two High
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Single Stand Two High
20" x 36" Single Stand Two High

ROLLS—FORMING
14 Stand Yoder, 2¾" Shaft, 30" Bet. Housings
18 Stand Custom Built, 2½" Shaft, will take 36" wide
14 Stand Custom Built, 1⅝" Shaft x 14 3/16"

ROLLS—PLATE STRAIGHTENING
108" Bertsch, Seven Rolls 9" Dia.
72" Niles, 7 Rolls 9" Dia. Motor Driven

SHEAR—ALLIGATOR
No. 4 Mesta RH LK, Capacity 2" x 12"

SHEAR—GATE
12' x ⅜" Niagara Model 1212, NEW 1951

SHEAR LINES
36" x .020 Ga. Halliden Shear Line
42" Bliss Up-Cut Shear, Capacity .125" Max. With Hump & Run-out Tables
53" x ⅝" Heavy Duty Shear Line
60 x 7 Ga. Shear Line
96" x 14 Ga. Cleveland Shear Line

SHEARS—SQUARING
10' x ¼" Cincinnati #1810
10' x ¾" Niagara No. 910

SHEAR—ANGLE
6 x 6 x ⅝" Hilles & Jones

SLITTER—36" Slitting Line Wean

STRAIGHTENERS
No. 3 Medart 3 Roll, Capacity to 4½" Tubing
Torrington 12-Roll Capy. 1¾" Hex., Sq., Etc.
No. OA Medart 2-Roll, Capacity ⅛" to 1" Bars
No. O Medart 2 rolls, Capacity to 1¼" dia. Bars

SWAGING MACHINE
#6½A Fenn, Capacity 3⅜" Tube, 1¼" Solid, 16" Die Length Hydraulic Feed, LATE

TUBE REDUCER
Standard 1½" Tube Reducing Machine Complete with Elect. Equip.

WELDING POSITIONER
Pandjiris Welding Positioner 22 x 20, Hoist Stroke 20' 10", Boom Stroke 20' 6" LATE

• Manufacturing

A. T. HENRY & COMPANY, INC.

50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7-3437

Equipment •

Confidential Certified Appraisals
Liquidations — Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

SLIP RING MOTORS

Constant Duty—3 phase, 60 cycle

Qu.	H.P.	Make	Type	Volts	R.P.M.
2	2500	Whse.	CW	4600/2300	720
1	2500	G.E.	Mill	2300	240
1	1800	Whse.	Mill	6600/4000	270
2	1800	Whse.	Mill	2200	252
2	500	Al. Ch.	ARY	2300	505
1	500	G.E.	I-M	2300	450
1	400	Al. Ch.	ARY	2200	505
1	400	Whse.	CW	2200	290
1	350	G.E.	I-M-15B	2200	1180
1	350	G.E.	MT-412	3200	450
1	300	Whse.	CW 1012	2200	720
1	350	Al. Ch.	ARY	440	705
1	250	G.E.	MT-414	2200	300
1	200	G.E.	I-M	2200	1760
2	200	G.E.	I-17-M	2200	585
1	200	G.E.	I-14-M	2200	494
1	150	Al. Ch.	ARY	440/220	720
1	150	Whse.	CW	4160/2300	585
1	150	Whse.	CW-1000	440	435
1	100	Whse.	CW	440/220	1160
1	100	El. Dy.	EDX612	2300	900
2	100	G.E.	MT-562	440/220	570
2	100	G.E.	I-15A-M	2300	495
1	100	Al. Ch.	ARY	440	430

SYNCHRONOUS MOTORS

3 Phase, 60 Cycle

Qu.	H.P.	Make	P.F.	Volts	R.P.M.
1	1750	G.E.	100	2200	3600
1	1500	G.E.	80	2400/4160	900
1	1500	Whse.	80	2300	514
1	920	G.E.	80	2200/440	300
1	710	G.E.	80	2300	720
1	450	Whse.	100	2200	128.5
3	350	G.E.	100	2300	900
1	300	G.E.	100	2300	720
1	300	G.E.	80	2200	600
2	300	G.E.	80	440	400
2	250	Whse.	80	440	600
1	200	Al. Ch.	100	2200	514
1	200	Al. Ch.	100	2300	360
1	150	G.E.	100	2200	900
1	150	El. Mchy.	80	220	720
1	150	G.E.	100	550	600
3	125	G.E.	80	4000/2200	1200
1	125	G.E.	80	2200	900
2	100	Whse.	80	440/220	1800
1	100	Ideal	80	440/220	900
2	100	G.E.	80	440/220	600
1	100	El. Mchy.	100	440/220	860
2	50	G.E.	80	2200	600

T. B. MAC CABE COMPANY
4302 Clarissa St., Philadelphia 40, Penna.
Cable Address "Macsteel" Philadelphia, Pa.
Phone Davenport 4-8300

RE-NU-BILT

GUARANTEED

ELECTRIC POWER EQUIPMENT

A. C. MOTOMS

3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
2	1750	G.E.	M-579BS	4800	1800
1	1500	G.E.	MT	6600	1187
1	1100	F.M.	OVZK, B.B.	4800	1800
1	800	G.E.	MT	2300	293
1	700	A.C.		2300	500
1	500	Whse.	CW	550	350
1	400	Whse.	CW	440	514
1	350	Cr.Wh.	Size 71	208/416	1765
1	350	G.E.	IM-17A	440-2300	720
1	250	G.E.	MT-424Y	4000	257
1	250	Cr.Wh.	Size 290	2300	350
1	250	Al.Ch.		550	600
1	200	G.E.	IE13 B-M	220/440	1760
1	200	Cr.Wh.	200B	440	505
1	200	G.E.	IM	440	435
3	200	G.E.	I-17AM	2200	435
1	200	G.E.	IM	2200	580
1	150	(unused)	Whse. CW	2300	435
1	125	A.C.		440	865
1	125	Al.Ch.		440	720
1	100	G.E.	IM-10	2200	435
1	100	G.E.	IM	440	600
1	100	A.C.	ANY	440	695

SQUIRREL CAGE

1	800	G.E.	KT-573	2200	1181
1	650	G.E.	FT-5-9BY	440	3570
3	500	Whse.	CS-1216	2000	500
2	450	Whse.	CS-1420	2300/4150	354
1	400	G.E.	IK	2200	500
1	300	Elliott	SC-BB DP	440	1770
1	300	G.E.	KT 559A	2300	1775
1	200	G.E.	IK 17	440	580
2	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440 900/450	
1	150	Whse.	CS856S	440	880
1	150	Whse.	CS	440	583

SYNCHRONOUS

Qu.	H.P.	Make	Type	Volts	RPM
1	7000	G.E.	ATI 2200/6600		600
1	4350	C.W.	3501SL	4000/6900/13800	514
1	3500	G.E.	TS	4600/2300	360
1	2850	Whse.	Sp.f	2300/4600	514
1	2800	Whse.	Sp.f	2300	720
1	2000	Whse.		2300	102
2	1750	G.E.	ATI	2300	3600
1	735	G.E.	ATI 2200/12000		600
1	450	Whse.		2200	128.5
1	325	G.E.	ATI	440	1800
1	225	G.E.	ATI	440	1800
1	100	G.E.	TS-7556	220/440	900

BELYEA COMPANY, Inc.
47 Howell Street, Jersey City 6, N.J.

MILES FOR VALUES

New Stock Catalog Available

96" Model 420 Barnes deep hole drill, 2 spindle
180 ton No. 27 Williams and White bulldozer
6" capacity No. 401 Campbell "Cutamatic" abrasive cut-off
2850 CFM Worthington 650 HP synchronous motor electric drive compressor
20" swing No. 217 Baker Brothers box column heavy duty upright drill
4' arm 9" column Cincinnati Bickford super service radial
24" Cincinnati 4 spindle upright drill, spindle motor drive
No. 15½ Foote Burt vertical hydraulic feed driver for a multiple head (2)
20" x 72" Landis type D heavy duty plain hydraulic cylindrical grinder
53" No. 24A Gardner vertical spindle horizontal disc grinder, 15 HP, multiple vee belt dr.
8" x 24" No. 3S Abrasive surface grinder
300 lb. No. 3C Chambersburg pneumatic forging hammer
2B Nazel forging hammer
4" bar Universal "Tri-Way" horizontal boring, milling and drilling machine
30" x 30" x 8' Cincinnati Hypro two rail, one right hand side head, dial feed planer
600 ton No. 664 Toledo tierod frame knuckle joint coining press
600 ton Elmes cast steel high speed downward acting hydraulic press
500 ton Baldwin Southwark high speed hydraulic vertical downward working press
800 ton Model 2E48-800 Hamilton straight side single crank air clutch press
750 ton No. 3 National all steel Maxipress
96" x ⅝" capacity Beatty No. 29 power squaring shear, late

Ask for latest stock list

MILES MACHINERY CO.
PHONE SAGINAW PL 2-3105
2041 E. GENESEE AVE. SAGINAW, MICH.

BENKART STEEL & SUPPLY COMPANY
CORAOPOLIS, PENNSYLVANIA
AMherst 4-1250
Dealers in new and used OET Cranes and Structural Steel Buildings.
Send us your inquiries.

BENNETT MACHINERY CO.
800 TON MILES WHEEL PRESSES
(2) Late Type 800 ton Wheel Presses, 96" between bars; max. dist. ram and resistance head 9'3" wgt. each 65,000 lbs.
(1) 32" Ohio Dreadnaught Shaper, M.D.
375 Allwood Rd., Clifton, New Jersey
Phone: PArsell 9-1996 N. Y. Phone: LOngacre 3-1222

No. ½, 1½ Buffalo Forge Univ. Ironworkers, Coper, Notcher.
6' x ¼" Lown Initial Type Bending Roll, M.D.

FALK MACHINERY COMPANY
16 Ward St. Baker 5887 Rochester 5, N. Y.

FRANK B. FOSTER, INC.

2220 Oliver Building, Pittsburgh 22, Pa.
Cable: "Foster, Pittsburgh" Telephone Atlantic 1-2780

1—28" x 40" HOT STRIP MILL, 2-high, reversing with 2500 HP D.C. motor, etc.
2—28" 3-HIGH ROLL STANDS with inlet, outlet and intermediate tables. Will produce 4" sq. billets from 8" sq. blooms in 6 passes. Includes bloom shear.
1—28" REVERSING BREAKDOWN MILL.
1—25" & 42" x 60" HOT STRIP MILL, 4-high.
1—28" PINION STAND, 2-high, modern design.
1—16" x 22" COLD MILL, 2-high.
1—10" x 14" COLD MILL, 2-high.
1—CLUSTER MILL, 4-stands, each with 2 work rolls 3¼" x 7" and 4 back-up rolls 5" x 6".
1—10" x 10" 2-HIGH COLD MILL. Combination pinion stand and gear, extra forged steel rolls.
1—10" ROD MILL.
1—9" BAR MILL, 3-high.
1—REEL, 11" face x 17½" dia.
1—UNCOILER, cone type, 60" max. width coils.
1—RECOILER for 80" wide strip.
1—1500 TON STEAM HYDRAULIC FORGING PRESS.
1—34" x 192" ROLL GRINDER.
1—44" ROLL LATHE, enclosed headstock, tailstock, piano rest, 20 HP 500/1500 RPM 230 volts, D.C. motor and controls.
2—90-ton Treadwell HOT METAL TRANSFER CARS.
2—65-TON ELECTRIC MELTING FURNACES, TOP CHARGE, with all electrical and mechanical equipment including 15,000 KVA and 13,333 KVA transformers.
1—ROLLER LEVELLER McKay, rolls 80" face & 5¼" dia. with gear box and universal spindles.
1—STRETCHER LEVELLER for sheets, 500,000 lb.
2—KANE & ROACH BAR AND ANGLE STRAIGHTENERS. Size #4, cap. 3" x 3" x ⅝" angles, 3½" channels and 2" bars.
1—STRAIGHTENER, MEDART NO. 0, for rounds ¼" to 1½" dia.
1—STRAIGHTENER, MEDART NO. 04A, for rounds ⅛" to 1" dia.
1—MORGAN FLYING SHEAR FOR BARS up to 1" dia. moving at speeds up to 1150 ft. per minute.
2—UNITED HOT SAWS, 59", sliding frame.
1—UNITED #4 BAR SHEAR vertical open side.
1—156" x ¼" SHEET SQUARING SHEAR.
1—SLITTING SHEAR FOR SHEETS, Mesta 92".
1—HALLDEN FLYING SHEAR LINE, capacity 36" wide x 20 to 34 gauge x 15' to 144" long.
1—Tandem SLITTING AND CUT - TO - LENGTH LINE, heavy duty, max. opening for 38" wide.
1—MORGAN INGOT STRIPPER CRANE, 50' span, 200 tons capacity, 230 volts D.C.
1—ALLIANCE LADLE CRANE, 4 girders, 30 ton main hoist, 25 ton auxiliary, 55'5" span, 42' lift.
3—Blaw-Knox SLAG LADLE TRANSFER CARS.
1—CORRUGATING MACHINE, Stamco, for 12' wide sheets, including several sets of removable dies.
1—DRAWBENCH, Mesta, oil-hydraulic, for 3 strands of bars 20' long
1—WIRE DRAWING MACHINE, Aetna-Standard, 16" block, 5-unit.
2—PICKLING MACHINES for sheets, Mesta.
2—60 - TON CAPACITY HOLDING FURNACES, electric, each with 7500 KVA transformer.
2—PACK FURNACES for hot sheet mills 62" x 60' double chamber.
1—60" GALVANIZING LINE for sheets with 2 roller levellers.
1—3000 HP GEAR DRIVE, ratio 500 to 73.7 RPM.
1—3000 HP GEAR DRIVE, ratio 500 to 95.8 RPM.
1—1200 HP GEAR DRIVE, 353 to 94.6 RPM, 3.73 to 1 ratio.
2—35 HP SPEED REDUCERS, Falk 21 to 1.
1—3500 HP MOTOR, 11000 volts, 3 phase, 60 cycle, 514 RPM.
1—1200 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 353 RPM.
1—50 HP MOTOR, G.E. frame MD-640-AE, 230 volts, 500 RPM.

2000# Chambersburg Pneumatic Forging Hammer, Late Type, Serial 20CH392L7.
2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944
6½" Square Capacity Alligator Shear; clutch operated; United Engineering & Foundry.
WHEELABRATOR, American; 36" x 42", skip loader hoist; dust arrester.
Lindberg Endothermic Atmospheric Generator; 750 CFH, output 2200 deg. F.
Bliss Trimming Presses Tie Rod Construction Side Shears Capacities 113, 150, 190 tons
3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress
6' x 10 ga. Cincinnati Squaring Shear, ¼" x 8' Pexto Gate Shear; 20" throat
Late Upsetting & Forging Machines with air clutch, 4" National, 2½" Ajax, 4" Ajax, 5" Ajax.
Williams White Bulldozers from 5-ton to 350-ton
Landis Landmaco and other Landis Threading Machines
Single & Double End Punches
No. 3 Motch & Merryweather Saw, with Saw Grinder
No. 3 Waterbury Farrel Progressive Header. Cap. ½"; 4 stations and 1 Cutoff
Ajax Forging Presses #5-C 500-ton, #7-C 700-ton.

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

DONAHUE STEEL PRODUCTS CO.
1919 W. 74th Street, Chicago 36, Ill.

UNIVERSAL
MACHINERY & EQUIPMENT CO.

MELTING FURNACES
3 KW AJAX Spark Gap Converter
Consumable electrode vacuum melting furnace
333 KW AJAX Induction Furnace, 1,000 lb. Cap.
250 lb. LECTROMELT Arc Melting Furnace
1½ Ton LECTROMELT Arc Melting Furnace
1000 lb. SWINDELL Arc Melting Furnace
1½ Ton HEROULT Arc Melting Furnace
3 Ton HEROULT Arc Melting Furnace

3 Ton Top Charge SWINDELL ARC FURNACE

HEAT TREAT FURNACES
1—LEE WILSON 150 KW, 5'6" x 8' I.D. Pit type
1—L.&N. 25 KW Homocarb Furnace
1—L.&N. 75 KW, 25" x 48" Electric Pit

CLEANING EQUIPMENT
PANGBORN 6' Type "LK" Rotoblast Table Room
36" Cont. AMERICAN Tumblast, 15 tons per hour
36 x 42 WHEELABRATOR w/skip loader
46 x 42 WHEELABRATOR w/skip loader
48 x 48 WHEELABRATOR w/skip loader

AMERICA'S LARGEST STOCK OF FOUNDRY EQUIPMENT

1630 N. NINTH ST., READING, PA.
Phone: FRanklin 3-5103

FOR SALE

Well equipped production Pressed Metal and Finishing Co. in New England. Now doing in excess of $300,000 annually with great potential for expansion. Full particulars furnished to qualified interested parties.

ADDRESS BOX G-661
Care *The Iron Age*, 100 E. 42nd St., New York 17

FOR SALE
COMPLETE BAR & ROD ROLLING MILL IMMEDIATELY AVAILABLE
Suitable for Rolling Steel or Copper billets down to bar or rod sizes, including hotbed, shears, and rod coiler.
STILL SET-UP, REASONABLY PRICED FOR IMMEDIATE SALE
NATIONAL MACHINERY EXCHANGE
126 Mott St. New York 13, N. Y.
CAnal 6-2470

ROLLING MILL

10" dia. x 16" W.F. 2 High.
Herringbone Mill Pinions & Herringbone gear drive.
Anti-friction bearings to gearcase. 4¼" vert. adj. of top roll.
Mill complete and ready to run.
Extra set of rolls, 75 H.P. motor drive.

EXCELLENT CONDITION

LANG MACHINERY COMPANY, INC.
28th St. & A.V.R.R. Pittsburgh 22, Pa.
GRant 1-3594

OVERHEAD ELECTRIC CRANE
10-ton P. & H., 96'3" span, 230-VDC, 35' lift, suitable for outdoor service.
M.E.T. Equipment and Construction Co.
4310 Clarissa Street Phila. 40, Pa.
Phone—DA 4-8300

WORLD'S LARGEST STOCK
STAMPING PRESSES
SQUARING SHEARS • PRESS BRAKES
REBUILT *and* GUARANTEED

WILL LEASE WITH OPTION TO PURCHASE, OR **WILL FINANCE** OVER LONG TERM

JOSEPH HYMAN & SONS
Tioga, Livingston & Almond Sts.
Philadelphia 34, Pa. Phone GArfield 3-8700

18" LANDIS PIPE MACHINE
THREADS AND CUTS PIPE 8" TO 18", NEW 1953, EXCELLENT CONDITION.
4A WARNER & SWASEY TURRET LATHE, 7¼" HOLE, BAR & CHUCK, SER. 296,600. EXCEPTIONALLY GOOD CONDITION.
ACE EQUIPMENT CO.
141 N. THIRD ST. PHILA. 6, PA.

OVERHEAD CRANES & HOISTS
1—5-ton Wright, 36'0¾" 2-motor 220/3/60 cy.
5-ton Northern, 55'4" span, 200/2/60 cy.
7½-ton Shaw, 46'3" span, 230 D. C.
15-ton, P&H, 51'5½" span, 230 D. C.
Many other cranes various spans and currents.
JAMES P. ARMEL CO.
711 House Bldg., Pittsburgh, Pa. Tele: Gr. 1-4449

SCRAP YARD FOR SALE
Scales, trucks, pick-up, office equipment, gas pump, welder, etc. Fenced and adjoining railroad track. Located in Elko, Nevada. Contact
SHANE IRON & METAL CO.
RENO, NEVADA

FOR SALE
One Lot 130,000 Socket Head Cap Screws 5/16-24 x 1 Cad. Plated
$2.30 per M, The Lot, F.O.B. Miami
LAFAYETTE TOOL & SUPPLY COMPANY
3355 N.W. 27th Avenue Miami 42, Florida

P. O. BOX 182, NILES, OHIO **Lou F. Kinderman** OLympic 2-9876

FOR SALE

1—Mesta #4 Alligator Shear, 6" x 2¼" x 27" blade, with motor.

2—"LECTROMELT" type NOT, electric melting furnaces, with ladles, transformers, slag pots, charging buckets and accessories.

2—90 ton Hot Metal Transfer cars.

1—24" x 20' long bed Roll Lathe, consisting of bed, headstock and motor, no other parts included. In good condition.

1—102" dia. Rotary Kiln, side discharge.

1—Gear Reducer, 500 HP, ratio 10 to 1, type H*B-V-1.

1—Medart Roll Straightener, model 04A, capacity ⅛" to 1", motor & control.

1—Marvel Saw, 18" x 18" Universal roll stroke hydraulic.

1—Lee Wilson Bell type Annealing Furnace, charge sizes 42" x 96", with gas generators, gas burners recording controls.

1—Rolling Mill, 3 stand, cold reduction, 10" dia. x 16" face, with pay-off reel, coiler, equipment.

1—4-High Cold rolling mill, roll sizes 12" x 5½" x 5½" x 12" x 10" face, with reels, lubrication system, electrical.

1—20" Guillotine type Shear, L & A, capacity 8" x 2" flats.

1—156" Squaring shear, capacity ¼" mild steel, with 2'0" x 14'3" table, motor & control.

1—#4½ U.E. & F. Co. vertical Bar Shear, 28" long knives, 15½" gap, 2" throw, motor, entry & delivery table.

WANTED

1—Cold Rolling Mill, 4-high Steckel type, roll sizes 2" work rolls x 6" face, coiler & uncoiler.

1—Cold Rolling Mill, 4-high preferably, roll size, 10" dia. x 16" face with coiler & uncoiler.

2—48" wide slitters, 2-Slitting Lines, 40" to 52", complete.

1—Shear, 200 ton capacity, 20" blade.

1—Shear, 20 ft. long x ½" mild steel capacity.

1—42, 2-high Blooming Mill, complete with all equipment.

1—50 ton Crane, 100' span, with auxiliary hook, 230 volt DC.

eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

PLAIN CYLINDRICAL GRINDERS
10 x 18" Cincinnati Model EA, m.d.
10 x 18" Norton Type C, m.d., latest
10 x 36" Cincinnati Hydraulic, m.d.
10 x 36" Norton Type C, m.d.
10 x 72" Landis, m.d.
12 x 36" Landis Plain Self-Contained, m.d.
12 x 96" Landis Self-Contained, m.d.
14 x 36" Landis Type C, 1944
14 x 52" Norton, motorized
16 x 72" centers Type C Norton Semi-Auto., Hydraulic
16 x 48" Landis Type D, 1945
16 x 72" Landis Plain Self-Contained, single m.d.
16 x 96" Cincinnati Plain Cylindrical, m.d.
16 x 120" Cincinnati, 1953
18 x 36" Landis Type C, m.d.
18 x 72" Norton Type C, mechanical, m.d.
20 x 120" Landis Plain Self-Contained, m.d.
25 x 72" Landis Type C, m.d.

THREAD GRINDERS
No. 33 Excello Precision, m.d.

SNAG GRINDERS
Type No. 50—7½ H.P. Standard Elec. Tool Co. Double End, m.d.
25 H.P. U.S. Elec. Co., Heavy Duty Double End, m.d.

UNIVERSAL GRINDERS
10 x 24" Landis Type C, m.d.
12 x 48" Norton, m.d., latest
14 x 48" Landis Universal
14 x 36" Norton, m.d.
16 x 22" Norton Universal Hydraulic, m.d.

KEYSEATERS
No. 3 Niles Cotter & Keyseat Milling Machine, m.d.
Morton, m.d., thru reversing gear box

INTERNAL GRINDERS
Type IG 100 Grenby, m.d.
No. 5 Bryant, m.d., latest
Model 5Y Bryant, m.d.
No. 16—16" Bryant, m.d., hydraulic Hole Grinder
No. 16CR16 Bryant, m.d., latest
No. 16—22" Bryant, m.d., latest
No. 16—38" Bryant, m.d., latest
No. 16-A—28" Bryant, m.d.
No. 24—36" Bryant Hole & Face Type, m.d., late
No. 24P—26" Bryant, m.d.
No. 24—21" Bryant, m.d.
No. 24-L—36" Bryant, m.d., late
No. 24-LW—36" Bryant, m.d., late
No. 44 Heald Facing Type Borematic, m.d.
No. 649—16" Van Norman Automatic Oscillating Radius, m.d., latest
No. 70A Heald, m.d., latest, 1945
No. 72A Heald Sizematic, "Duplex", m.d.
No. 72A Heald Gagematic, m.d.
No. 72A3 Heald Full Universal, m.d.
No. 72A3 Heald Gagematic, m.d.
No. 72A3 Heald Sizematic, m.d.
No. 72A3 Heald Plain, m.d.
No. 72A5 Heald Sizematic, m.d.
No. 72A5 Heald Plain, m.d.
No. 73 Heald Airplane, m.d., latest, new
No. 74 Heald, m.d.
No. 74 Heald Long Base, 1943
No. 75A Heald, m.d., latest
No. 72 Heald, Plain Long Base, m.d., 1941
No. 78 Heald Centerless Cylinder, m.d.
No. 81 Heald Gagematic, Sizematic, m.d.
No. 81 Heald Plain & Sizematic, m.d.
No. 194 Rivett, m.d.
No. 172 Heald Plain Adjustable Gap Hydraulic, m.d.
Model DB-102 Excello Double End Boring Machine, m.d.

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1241 "TWX" CI 174 CABLE ADDRESS—EMCO

AVAILABLE 3500 K.W. M.G. SETS SAVE $300,000

ALLIS-CHALMERS 3-Unit Sets Each Consisting of:

(2)—1750-KW Generators 250/350-Volt parallel, 500/700 Volts series, 5000 amps., 514 R.P.M., separately excited fields, direct connected to a common 5000-HP Synchronous motor, 13,800/6900/4000-Volt, 3 phase, 60 cycle.
The above rated continuous 40° C, class B insulation with enclosing covers, motor driven fan, for forced ventilation.
Each set includes a direct connected 10-KW and 40-KW exciter.

These are of very late design with rolled steel frames, and were used very little.
Will furnish REBUILT, with A.C. and D.C. switchgear.
For additional information contact one of the following dealers closest to you.

T. B. MacCabe Company
4300 Clarissa Street, Philadelphia 40, Pa.
Morehead Electrical Machinery Co.
120 Noblestown Road, Oakdale (Pittsburgh District) Pennsylvania
Brazos Engineering Co., Inc.
P. O. Box 9114, Houston, Texas
Duquesne Electric & Mfg. Co.
6428 Hamilton Avenue, Pittsburgh 6, Pa.

EST. 1904

DAVIDSON

PIPE COMPANY INC.

ONE OF THE LARGEST STOCKS IN THE EAST

Seamless and Welded ⅛" to 26" O.D.
All wall thickness Manufactured.
Specialty large sizes.
Cutting — Threading — Flanging — Fittings — Valves.

Call GEdney 9-6300
50th St. & 2nd Ave., B'klyn 32, N. Y.

FOR SALE

FREIGHT CAR REPAIR PARTS
RELAYING RAILS & ACCESSORIES
STEEL STORAGE TANKS
FRT. CARS & LOCOMOTIVES
CONTRACTOR EQUIP. & MACHINERY

THE PURDY CO.
8754 S. DOBSON AVE.
CHICAGO 19, ILL. — BA 1-2100
ALSO ST. LOUIS, MO., SAN FRAN. AND LONG BEACH, CALIF.

FIBER SANDING DISCS

Established quality manufacturer has amazing deal for quantity users and salesmen. Samples available for testing.

WRITE STANDARD ABRASIVES,
DIVISION OF MARVEL INDUSTRIES,
BUICK STREET, BOSTON 15, MASS.

OFFERING

BRIDGE CRANES

ARNOLD HUGHES COMPANY
2765 Penobscot Bldg. Detroit, Mich.
WOodward 1-1894

PIPE
VALVES and FITTINGS
All Sizes in Stock
NEW—USED
GREENPOINT PIPE SUPPLY CORP.
344 Stagg Street Brooklyn 6, N.Y.

RAILS—All Sections

NEW RELAYING—All Accessories
TRACK EQUIPMENT, FROGS—CROSSINGS—TIE PLATES, CONTRACTORS AND MINE & MINING MACHINERY CARS

M. K. FRANK
Grand Central Palace, New York
401 Park Bldg., Pittsburgh, Pa.
105 Lake Street, Reno, Nevada
1209 Metropolitan Bank Bldg., Miami, Fla.

EQUIPMENT AND MATERIALS WANTED

WANTED

One used power squaring shear, gap type; capacity 10 feet by ½-inch mild steel. Also one used set of plate bending rolls, initial or pinch type; capacity 12 ft. by 1-inch mild steel. Frick Company, Waynesboro, Pennsylvania. Phone 1245, extension 47.

WANTED
NEW **SURPLUS STEEL** USED
Structurals, Plate, Pipe and Tubing
Consumers Steel & Supply Co.
P. O. Box 270, RACINE, WISCONSIN

WANTED
SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
38 Years of Steel Service

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

WANTED
One—36" to 48" x 216" to 240" ROLL GRINDER — USED. Preferred with crowning attachment
Call or Wire: L. JEFFERS
Aetna-Standard Engineering Co.
Ellwood City, Penna. Phone: Plaza 8-4511

***Try the* WANTED SECTION**
***for* "Hard-to-Find" Materials or Equipment**

EMPLOYMENT EXCHANGE

HELP WANTED

METALLURGICAL SALES ENGINEER

For Eastern District Office recently opened in Baltimore, Maryland.

Graduate Metallurgist with experience in the use and application of ferro alloys in the steel industry. Previous sales experience desirable. Correspondence will be treated confidential.

Pittsburgh Metallurgical Company, Inc.
3801 Highland Avenue
Niagara Falls, New York
P. O. Box 368 Attn: Sales Department

Stainless Steel Project Engineer

To supervise the engineering and manufacturing of stainless steel cabinets including sinks, table tops, tubs, fume hoods and other custom made specialized laboratory equipment.
Must possess a practical knowledge of design, layout, forming dies, jigs and fixture heliarc welding, and grinding and polishing of stainless steel. Advise full particulars including salary requirements. Write Personnel Manager, Hamilton Manufacturing Company, Two Rivers, Wisconsin.

PURCHASING AGENT
New England Area
Prefer someone with five or more years' experience in machine tool or heavy machine industry. Give complete history and salary requirements.
ADDRESS BOX G-669
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

CLEANING ROOM SUPERINTENDENT

MUST HAVE SUPERVISORY EXPERIENCE AND BE COMPLETELY FAMILIAR WITH ALL PHASES OF CLEANING ROOM OPERATIONS FOR A MISCELLANEOUS STEEL JOBBING FOUNDRY PRODUCING CASTINGS UP TO 10,000 POUNDS. EXCELLENT OPPORTUNITY FOR AN AGGRESSIVE QUALIFIED MAN WITH A MODERN AND PROGRESSIVE FOUNDRY LOCATED IN THE MIDDLE WEST PRODUCING 600-700 TONS PER MONTH. ADVISE FULL PARTICULARS INCLUDING SALARY REQUIREMENTS.
ADDRESS BOX G-628
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

Junior Metallurgist or chemist for a non-ferrous smelting plant. Opportunity for supervisory position in production with advancement opportunities. We will train you in all phases. Some experience desired. Progressive company located on East Coast.
ADDRESS BOX G-670
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

OPENING FOR ROLLER ON 12 INCH MERCHANT MILL. Address Box G-665, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

ACCOUNTS WANTED

Do you need national sales representation?

For manufacturers of stock proprietary items, we have available a national sales force with valuable contacts in the original equipment market. We are in a position to handle additional industrial components non-competitive to our own line. If you're in need of national representation, send a description of your product and other pertinent data to

BOX G-664
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39
Replies held confidential.

WILLIAM M. SCANLON CO. Sales Organization covering 100-mile radius. Philadelphia Metal Fabricating and O. E. M. Account requires additional lines. Call, write or wire 477 Harwicke Road, Springfield, Delaware County, Pa. Phone Kingswood 4-2454.

SITUATION WANTED

SALES EXECUTIVE: For Alloy Plate Fabrication, graduate engineer with a twenty year background in production, engineering and sales management of custom built chemical process equipment primarily in the alloys. Seek new challenge in N. Y., N. J., or Pa. area. Address Box G-657, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement.

A

Ace Equipment Co. 126
Aetna-Standard Engineering Co. 128
Ajax Electric Co., Inc. 95
Ajax Electrothermic Corp. 95
Ajax Engineering Corp. 95
*Allen-Bradley Co. 19 & 20
American Gas Association 22
*American Monorail Co., The 30
American Steel & Wire Div. United States Steel Corp. 21
*American Welding & Mfg. Co., The 96
Arcos Corp. 68 & 69
Armel, James P., Co. 126
*Armstrong Bros. Tool Co. 100
*Atlas Car & Mfg. Co., The 94
*Atlas Mineral Products Co. 11

B

Babcock & Wilcox Co., The Tubular Products Div. 4
Baldwin-Lima-Hamilton Corp. Loewy-Hydropress Division 5
Belyea Co., Inc. 125
Benkart Steel & Supply Co. 125
Bennett Machinery Co. 125
*Beryllium Corporation, The 17 & 18
Bethlehem Steel Co. 1
Bliss, E. W., Co., Rolling Mill Div. 12
*Brainard Steel Div. Sharon Steel Corp. 71
*Bridgeport Brass Co. 48
Bullard Co., The 53

C

Chase Brass & Copper Co. 31
*Cincinnati Grinders Incorporated 56
*Clark, Robert H., Company 100
*Cleveland Worm & Gear Co. 34
Columbia-Geneva Steel Div. United States Steel Corp. 21
Consumers Steel & Supply Company 128
*Cromwell Paper Co. 32

D

Davidson Pipe Co., Inc. 127
*Diamond Manufacturing Co. 9
Donahue Steel Products Co. 126

E

Eastern Machinery Co., The 127
*Elastic Stop Nut Corp. of America 99

F

Falk Machinery Co. 125
Foster, Frank B., Inc. 126
Frank, M. K. 127
Frick Co. 128

G

Gardner Machine Co. 8
*General Electric Co., Apparatus Dept. 14 & 15
Goss & DeLeeuw Machine Co. 129
Greenpoint Pipe Supply Corp. 127

H

Hamilton Mfg. Co. 128
Harris Foundry & Machine Company 10
Hendrick Manufacturing Co. 109
Henry, A. T., & Company, Inc. 125
Hewitt-Robins 70
Hughes, Arnold, Co. 127 & 128
Hyman, Joseph & Sons 126

I

*Inland Steel Co. 45
Iron & Steel Products, Inc. 124

J

Jeffrey Mfg. Co., The 23
*Jones & Lamson Machine Co. 59, 61, 63 & 65
Jones & Laughlin Steel Corp., Strip Steel Division 50

K

Kinderman, Lou F. 127
*Kirk & Blum Mfg. Co. 93
Klaff, H., & Company 111

L

*L & J Press Corp. 101
Lafayette Tool & Supply Co. 126
Lang Machinery Co., Inc. 126
*Loewy-Hydropress Division Baldwin-Lima-Hamilton Corp. 5
Luria Bros. & Co., Inc. 113

M

M.E.T. Equipment & Construction Co. 126
MacCabe, T. B., Co. 125 & 127
Magnethermic Corp. 27
Miles Machinery Co. 125

N

National Automatic Tool Co. 72 & 73
National Machinery Exchange 126
National Steel Corp. 67
National Tube Div. United States Steel Corp. 21

P

Pangborn Corp. Inside Back Cover
Pittsburgh Metallurgical Co., Inc. 128
Pittsburgh Steel Co. 24 & 25
Platt Bros. & Co., The 100
Purdy Company, The 127

R

*Republic Steel Corp. 28 & 29
Roebling's, John A., Sons, Corp. 130
Ryerson, Jos. T., & Son, Inc. 6

S

Scanlon, William M., Co. 128
Shane Iron & Metal Co. 126
Sharon Steel Corp. 91
*Speed-D-Burr Corporation 13
Standard Abrasives Div. of Marvel Industries 127
*Starrett, L. S., Company 47
*Superior Tube Co. 54

T

Tennessee Coal & Iron Div. United States Steel Corp. 21
*Thermo Electric Co., Inc. 92
Timken Roller Bearing Co., The Back Cover
*Tinnerman Products, Inc. 74

U

Udylite Corp., The 16
*United States Steel Corp. 21
United States Steel Export Co. 21
United States Steel Supply Div. United States Steel Corp. 21
Universal Machinery & Equipment Co. 126

W

Wallack Bros. 128
Washington Steel Corp. 104
Wean Engineering Co., Inc., The Inside Front Cover
*Weirton Steel Co. 67
Weiss Steel Co., Inc. 128

Y

*Yoder Co., The 66

CLASSIFIED SECTION

Clearing House 124-127
Contract Manufacturing
Appears in first and third issue of each month. See Jan. 2 & Jan. 16.
Employment Exchange 128
Equipment & Materials Wanted 128

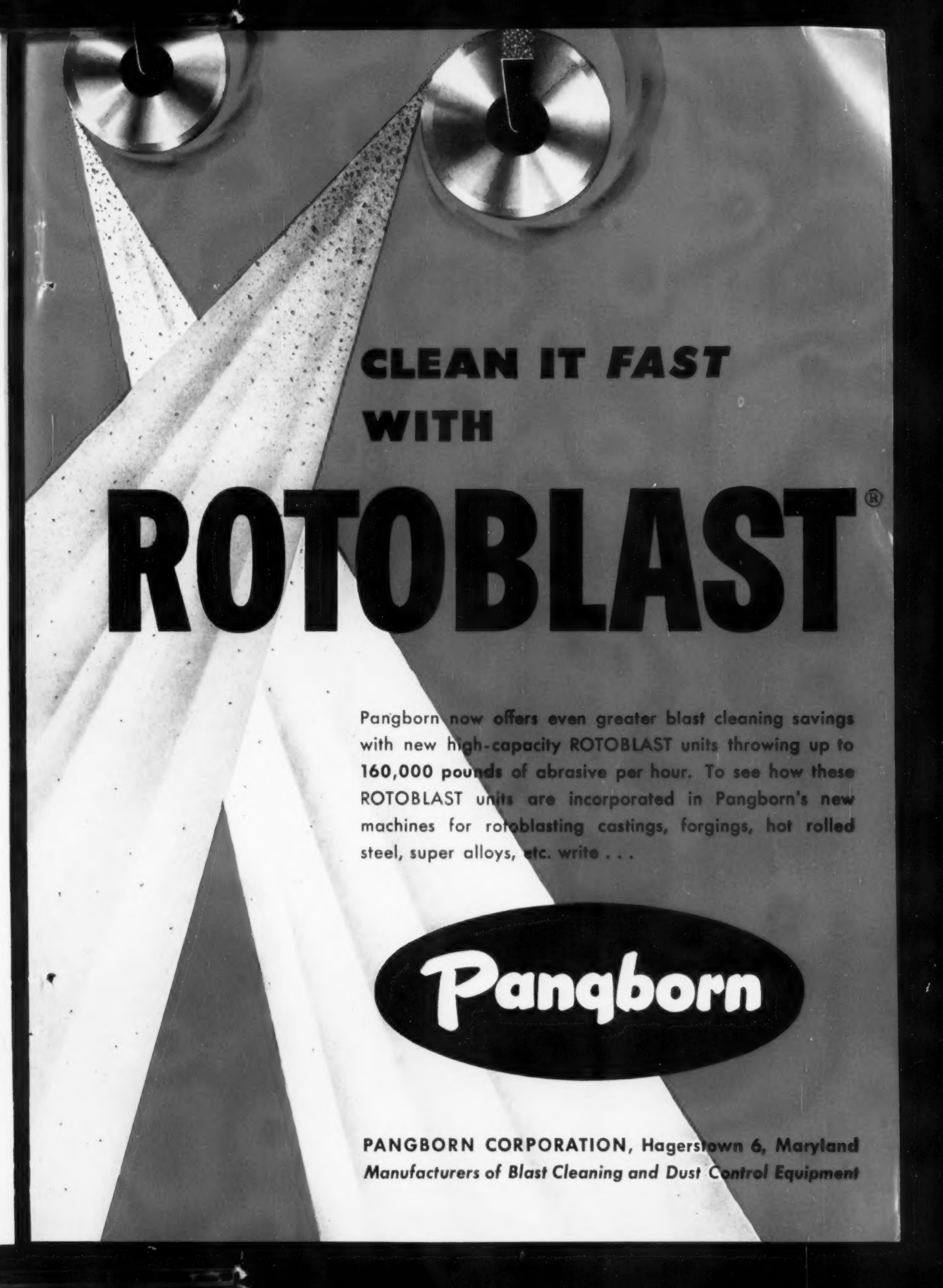
GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Four, Five, Six, Eight Spindles • Work and Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

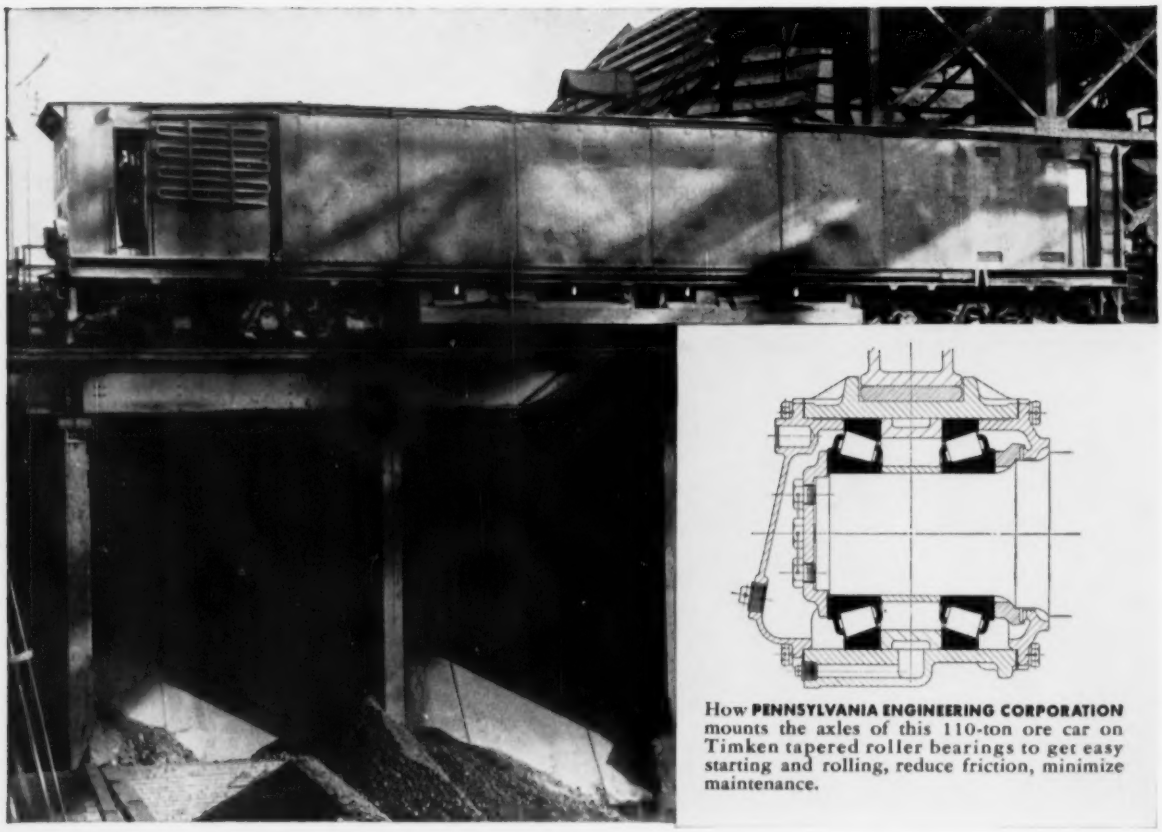
NOTHING **TRANSMITS POWER** AT SUCH LOW COST FOR **SO LONG** AS ROEBLING ROYAL BLUE WIRE ROPE. No means of transmitting power can be compared—on a cost basis—with Royal Blue, the strongest wire rope you've ever used. Meeting industry's stringent service demands is a function fulfilled by Royal Blue in many ways: unimpaired flexibility, great resistance to shock, abrasion and corrosion . . . a plurality of qualities that make for singularly long service life. For further details on "length through strength," communicate with Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

ROEBLING
ROYAL·1105·BLUE
DESIGN
FOR WIRE ROPE
Its ready adaptability is evident wherever power is transmitted. It conforms to unique design requirements. Use wire rope to transmit power.


CLEAN IT FAST
WITH
ROTOBLAST®
Pangborn now offers even greater blast cleaning savings with new high-capacity ROTOBLAST units throwing up to 160,000 pounds of abrasive per hour. To see how these ROTOBLAST units are incorporated in Pangborn's new machines for rotoblasting castings, forgings, hot rolled steel, super alloys, etc. write . . .
Pangborn
PANGBORN CORPORATION, Hagerstown 6, Maryland
Manufacturers of Blast Cleaning and Dust Control Equipment



How **PENNSYLVANIA ENGINEERING CORPORATION** mounts the axles of this 110-ton ore car on Timken tapered roller bearings to get easy starting and rolling, reduce friction, minimize maintenance.

New 110-ton ore car starts easier, rolls smoother and longer on Timken® bearings

BECAUSE this ore car carries a whopping 110-ton load, it has to be easy to start and keep rolling. It's a natural spot for Timken® tapered roller bearings. And it's no wonder that Pennsylvania Engineering Corporation used them on all 6 axles.

Because Timken bearings *roll* the load, starting resistance is cut up to 88%. There's no metal-to-metal sliding friction. Fully loaded cars start easier, with less power loss.

Geometrically designed and precision-made to roll true, Timken bearings virtually eliminate friction. Cars roll smoothly.

And Timken bearings take the tremendous weight and heavy shock loads. Their rollers and races are case-carburized to have hard, wear-resistant surfaces over tough, shock-resistant cores. Full line contact between rollers and races gives Timken bearings *extra* load-carrying capacity. Their taper lets Timken bearings take both radial and thrust loads in any combination. No costly extra thrust devices are needed. Bearing life is longer, maintenance is minimized.

What's more, by holding housings and shafts concentric, Timken bearings make closures more effective. Dirt and dust stay out. Lubricant stays in.

For all these advantages, specify bearings trade-marked "Timken" for the machines you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS ROLL THE LOAD